THE AMERICAN ARCHITECT

VOL. CXIII WEDNESDAY, JUNE 5, 1918 NUMBER 2215

Architecture After the War

By C. H. BLACKALL, *F. A. I. A.*

HOWEVER we may try to account for it, or in whatever manner we may seek explanations or excuses, the fact is unquestioned that in this, the greatest crisis the world has ever seen, architects have not been given a leading part. A profession which calls pre-eminently for powers of organization, administration and the kind of efficiency which springs from clear conception and an equally clear adherence to the essential facts of the problem, has found almost no part to play in the tremendous upheaval of these days except to be incidentally employed in one of the simplest problems offered to the architect, namely, low-priced houses, and then often in competition with builders and real estate speculators. Instead of being judged, and condemned or accepted for our share in the essentials of life, for our real solution of live problems, we seem to have been classed with the merely pretty arts which dress life but do not create it. We cannot legally complain of the choice which has been made of agents and methods for carrying out the enormous building problems which the country has undertaken. The fact that architects have had so little to do with them, and that their employment by the Government is so rare as to arouse wonder when so employed at all, is something which we must accept; but it is the wise man who, passing through stress, emerges therefrom into greater possibilities, and who finds through his failures the road to success. We therefore can properly consider that our present professional position is not sent to us for our sins, nor merely for our chastening, but in order that we may be able so to arrange our architectural deportment and possibilities that the future may give us greater promise of growth.

There are two distinctly varying concepts of an architect. The first is that he is an artist, that his chief interest is in making pictures, either on paper or in actual composition; that business has nothing to do with him except as an incident to his art; that, as architecture is the mother art, therefore the architect is at his best when occupying himself most exclusively with the pure art of his profession. This view does not preclude a recognition of business, construction and other so-called practical factors, but it puts the emphasis on the creative and artistic, relegating everything else to a second place. This is the view which has gradually been gaining since the beginning of the Italian Renaissance, and which has dominated the profession during the past few years, shaping its ethics, controlling its practice, and, in as far as it is one-sided, limiting the effective output of the individual. The other view is expressed by the very word "architect." He is not the "builder of arches" but the "arch technician," or, to use the modern phrase, the master builder. His function is to do and plan things in an orderly sequence and with a consideration for all the factors which enter into a complete structure, of which, very naturally, the artistic appearance may be beyond question an important one, but is not of itself sufficient, and, except in rare cases of monumental design, is really a by-product rather than a dominant factor. He differs from the engineer in that he is not to be one-sided, not to consider mere efficiency nor mere program, nor mere so-called practical factors, but is to take all of these plus the fundamental principles of order, purpose and fitness; and if they are properly combined then the creative element of pure design will result just as inevitably as it did in the west front of Amiens or the north porch of Chartres.

This second concept was the point of view of the thirteenth century, and if the signs of the times are read aright it is the attitude that the architect will be forced to assume, even against his will at times, and even if under imputation by some of his professional brethren of being unprofessional. The absence of this attitude, or the negation thereof, is sure to bring paralysis to the profession, because the busy public, which pays the bills, has scant use to-day for anything but action. The war has emphasized this view with sharp and, to many, sickening vividness. It is not enough to be a clever designer, or even the best designer, if best is used

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in the sense of permitting a disregard of functional building. Rather should we say that absolutely nothing be sacrificed to mere appearance. Artistic appearance, so called, can, and justly will, be forgotten and be apparent only through its function as an integral part of a real problem solved in a real way. That was precisely the fundamental point of view of the mediæval artists. Their work was always objective; self was always put out of sight, and as we emerge into the opportunities of to-morrow it is our task to make sure of our point of view, and not only make sure of it but incorporate it in our work. The architect may continue to dream dreams and see visions, but if he does he is likely to be out of a job unless those visions are based on sound common sense, on business administration and on constructive development and application.

There will always be building so long as mankind is a gregarious animal. There will also always be a consideration given to the finer artistic qualities which the race incorporates in its monuments and which constitute the true historical record of the age. The question we are interested in as a profession is as to who is to be the directing force in this building work. Will it be the master builders, as they are now known? Will it be the engineers, whose day is shining so full of promise now, or will the choice be from the profession which has striven and aspired, written codes of ethics, and taken position on pedestals, beneficently arrogating prominence in constructive arts, and speaking *ex cathedra* on every occasion, only to find that consideration is no longer an inevitable appanage? It is really a pretty serious question for us. No man is likely to have the whole truth revealed to him, and none of his reasoning from finite experience and limited vision can hope to answer all of the questions; and yet it hardly seems possible that the architect of four years ago will have much consideration four years hence, unless he changes very fundamentally. He must be a new man, regenerated by the acid test of trouble, and with a point of view toward real architecture more nearly akin to the mediæval period. It is the writer's conviction that the architect of to-morrow will find his truest inspirations in the mediæval attitude rather than in that of the Renaissance; that whether we admit it or not, whether we like it or not, whether we are chosen or not, the architect of to-morrow must be not first an artist but first an organizer and an administrator. That the older members of the profession will change, is, of course, very much to be doubted; that many mistakes will be made goes without saying; that the unworthy and the unfit will be just as prominent then as they are now is too manifest to need discussion. But that the architecture of after the war will be something real and something earnest, not obscured but thoroughly concrete, and that the architect will then be the one who can lead in just such lines, whether he comes from technical schools, from the engineering ranks, or from the master builders, is something which I firmly believe, and to which all the signs of the times seem to point.

At the risk of repeating, let me say what I think the architect of to-morrow will be.

In the first place, he will be an organization rather than an individual; a directing, discriminating motive force at the center of a combination of forces, and that organization or combination will be just as essentially a business one as the United States Steel Corporation or the Standard Oil Company, and exactly the same principles of economy, material efficiency and careful attention to detail will of necessity manifest themselves. This organization will be prepared not only to carry out work on definite lines, but to pledge itself that they will be carried out right and on time. In other words, it will guarantee results, and not be able to avoid responsibility by sheltering itself behind a cloak of professionalism. I do not believe that it will assume all the functions that we now hand over to the master builder, any more than I believe the master builder will lose materially in his particular line, but it will have a greater degree of direct contact with the mechanics, many times, I believe, a direct hiring of them on behalf of the owner and a general direction of the work which is now very often in the hands of brokers styling themselves master builders. And the fact that this organization is to free itself from mere professionalism and abandon the cloister or studio point of view will necessarily bring it into the world's markets so that it will have direct contact with the producing factors that enter into a building. It may even direct these producing factors and be a part itself of the producing side; and still further, as all large works have to be financed, I see no reason to doubt that the architect will have a considerable importance as an administrator, and therefore necessarily, to a certain extent, as a financial agent.

Furthermore, this organization will be formed not to win a competition or to impress a susceptible public, but to carry out building. The kind of organization that will win a competition is pure theory, and pure theory is what we must avoid. The organic development of building, if looked at right, is pure architecture, and that is just what the world wants. It is to be hoped that the future may see a larger abolition of that unfortunate method of bringing ourselves before the public which we call competition. The true competition always is in the finished product, but the idea that

by a series of drawings an architect can win recognition is, I believe, at the basis of a good deal of our present limitation as a profession; and the more resolutely we in the future refuse to consider architecture as in any sense drawing, as in any sense picture making, the more surely will we emerge into the larger view which the coming years are to demand and to which we have been so blind in the past. There are many who have had their eyes opened to the extent to which we have not as a profession properly viewed our limitations, and we will have further disagreeable experiences, I am afraid, before the true architectural point of view is brought home to us. We are still passing through the mill, and compensation for our present woes ought to be, in part at least, in the feeling that out of defeat can and will grow a better equipment for victory.

Does this imply that architecture will be any less a fine art than it is to-day? Not a bit of it. The trouble with so much of our pre-war architecture was not that it was too artistic, but it was not artistic in the right sense, in that it was not fit and appropriate for its purpose. Ruskin's emotional stone carver who, just for the love of carving, would cut a wondrous bit of detail way up in an obscure loft, where no one would ever see it, could keep on doing just that sort of thing sometimes, but he would not be in the architectural spirit. The place for that kind of work is in a museum and not in a real building. Architects are to build real buildings, and the man who would waste that kind of sentiment would be out of place in the very practical, very tense and very demanding world of after the war. The best art always has been the art which was the most real in its application. Architecture would still be the mother art, but the architect, while admitting the pre-eminence of the artistic thought, would, I should hope, recognize also that art is not pre-eminent or maternal which is simply blossoming for itself without a distinct purpose, and the architect who thinks for a moment that the contemplative, esthetic point of view, delightful as it is, necessary in a certain degree as it has been found to be, will suffice for after-war conditions is bound to receive a harder jolt and a more bitter disappointment than in these parlous days of 1918. To paraphrase the poet, architecture is real, architecture is earnest, and mere unrelated beauty is not its goal. A dream of pure art, a dream of beauty cannot be spoken of the real soul of a building.

Nor does the foregoing imply the elimination of the individual. There have been some wonderfully endowed men like Wren, Mansart or Bulfinch, who seemed to be able to compass all sides of our profession and to properly subordinate the relative factors; but, after all, most of us work best in harness and with limitations, and the very fact that an organization implies subordination of one part to the other is a salutary restraint on the development of the unessential. Again, a man might be just as strong and true alone by himself as he would be as an individual doing similar things at the head of an organization, but somehow I cannot help feeling that the individual architect will be much more of a rarity in the future than he has been in the past, and that in organization, in co-operation and specializing within the limits of a firm the architects will find their best opportunities.

After the war this country will undoubtedly pass through a period of enormous building activity. We have slowed up on all our lines; we are behind in every kind of structure having to do with the arts of peace; our investments in real estate have had a great setback, and for certainly three or four years after the war there will be a lot of big prizes to be passed out to some one. Who will get these prizes? Will it be those who want them most or those who can do them best? The answer is so obvious that it hardly needs argument. The great mass of our people do not know and do not care whether a building is artistic or not, especially as far as relates to the selection of an architect, but the great mass of our people, on the other hand, are pretty good judges of what they like, and unless we are prepared as a profession to give them a square deal, a business administration and a workable solution of the so-called practical requirements; and unless, furthermore, we can do all that, and, besides, clothe our expression in real art—and by real art I mean art that is fitting and proper, neither overlaid, considered apart, nor obtruded—we simply will not get the work, and the sooner we admit it and shape our plans accordingly the more likely we are to be of real service to the community for the next ten years.

I believe the profession will justify itself to the world, and justify itself in a way to bring absolute conviction to the public, whose attention has really never been caught by mere pretty work. The thought and study, the intense preparation, the carefully considered educational scheme which has been so thoroughly developed in the past, cannot fail to count in the long run for the very best side of real, practical, common-sense architecture. It is, of course, much easier to make these general statements than it is to say just how the results will be manifested. I sometimes wonder if a good deal of our troubles in the past and in to-day have not arisen from the fact that we have allowed the general public to believe that a diploma of architecture, or sometimes even a sign on a door, is an indication of ability, and whether we have not been

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a little ready to assume that an architect can be such by mere willing to be; that the will to win will create a good architect, according to our imaginations, just as some military critics think the will to win insures the winning of the war; and it is quite possible that certain portions of the public have accepted us at our face value and assumed, because we called ourselves architects, that therefore we be such. I sincerely hope the war and our present experience may brush this idea absolutely aside. Temperament, natural endowment and birthright certainly count for as much in the practical business side of architecture as they do in the dream life of the imaginative designer, and the number of those who are really able to handle the architectural problems is, after all, surprisingly small. The public will appreciate this better after the war, and the architect who has the gift not to make pictures but to make architecture will undoubtedly have ample opportunity, and with a clearer field and a more sure appreciation if he can deliver the goods; but may the profession be delivered for generations to come from the attitude that the architect can create himself, that a four-years' course in a school can make amends for a wrong temperament, or that even the fathering of a lot of poorly designed buildings gives a man the right to call himself an architect.

The architectural profession will profit by the experiences of the war. A future opens up for it bigger than anything we dreamed of before, because our buildings will be real buildings instead of fancies, our business will be real business instead of that of dilettanti, and there is enough real common sense in the profession to enable even some of the older ones to grow into administrative ability; while as for the young men who will be coming home from the wars, eager and ready to take their share, and fresh from the influences of the delightful atmosphere in France, they surely will be doing real things, just as they are doing real things now, and the biggest thing on earth will then be, as we have fondly assumed it had been in the past, a great work of architecture.

SCULPTURED RELIEF FROM ARCH OF TITUS, ROME

Morgan Park, Minn.

An Industrial Suburb for the Minnesota Steel Company

DEAN & DEAN, *Architects*

AS an example of a modern industrial suburb, intended to serve as a nucleus of a permanent industry, Morgan Park possesses many features of important interest. Its development has been along systematic and orderly lines; correct principles of town planning have been followed, and the educational and recreative elements necessary in a development of this character have been provided in a most modern and satisfactory manner.

While Morgan Park is, in a sense, a suburb of the city of Duluth, Minn., it is in reality an industrial town, owned and supplied by a company subsidiary to the United States Steel Corporation.

The architectural treatment of this industrial community has been carried forward with considerable skill, and is of particular interest, inasmuch as one type of material—concrete in two forms, block and stucco—has been employed in all the construction. As will be noted by the series of illustrations presented in this issue, this use of a one-type material has not resulted in the monotony usual in most instances, but a very large variety has been attained, and the whole esthetic result is much to be commended.

The idea underlying the creation of this community was to establish a location where it might be possible efficiently to house all the present and future labor force of a large manufacturing corporation. In this scheme of housing the word "labor" has been used to indicate every form of employment, from the cheapest day laborer to the most skilled employee, including clerical and managerial. For these reasons the types of buildings range from the unpretentious four-room house through the various grades to the better class of suburban dwelling. The results thus far achieved have been such as to prove the farsightedness of those who formulated the plan and have carried it to its present state of completion. There has been prevented any exploitation of the steel company's employees, similar to exploitation in other

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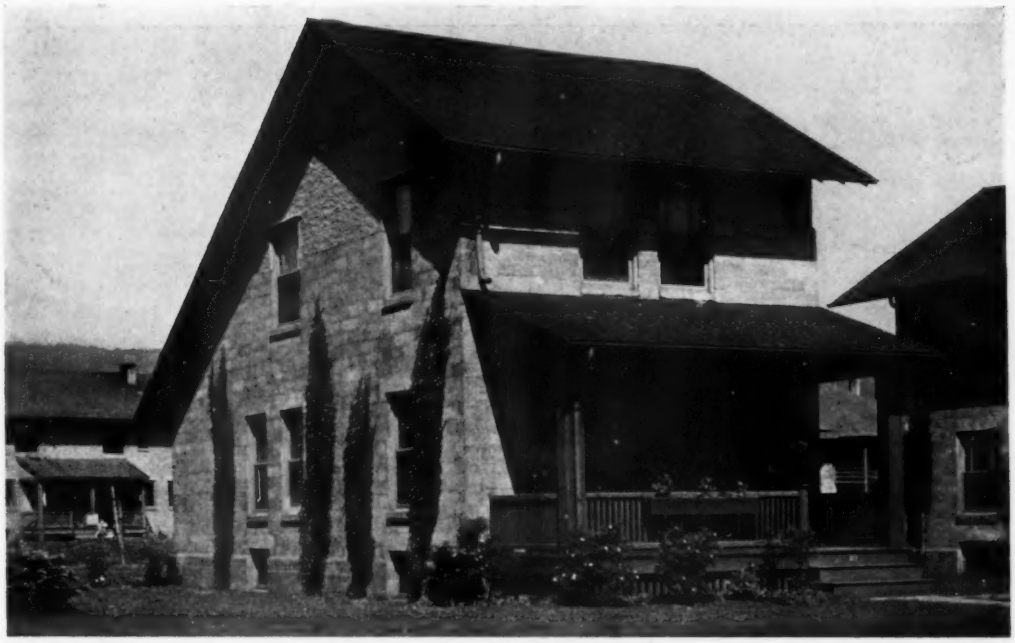
STREET SCENE IN BOARDING HOUSE SECTION

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*

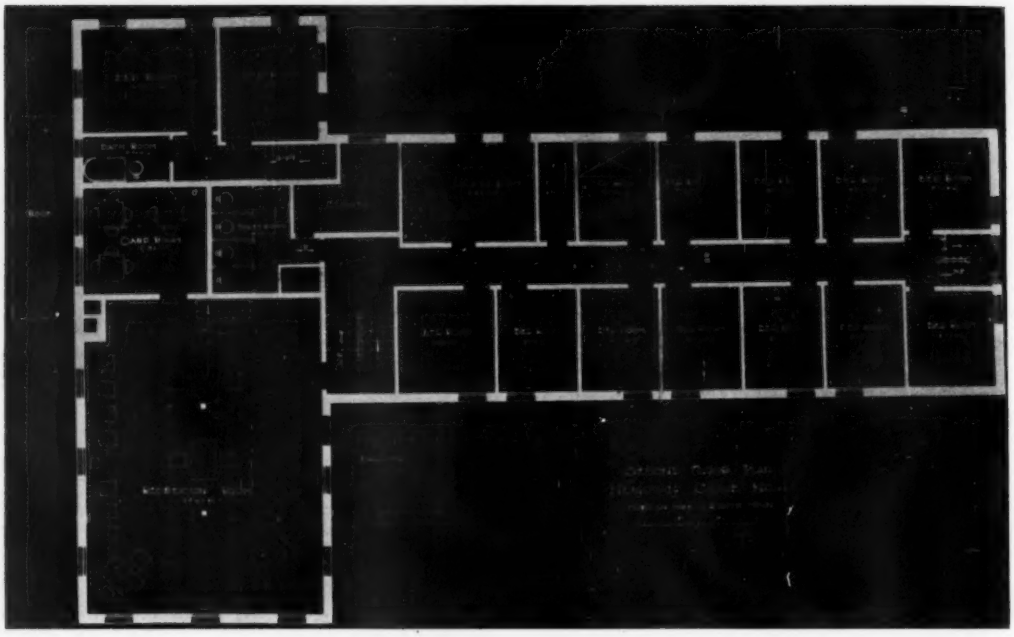


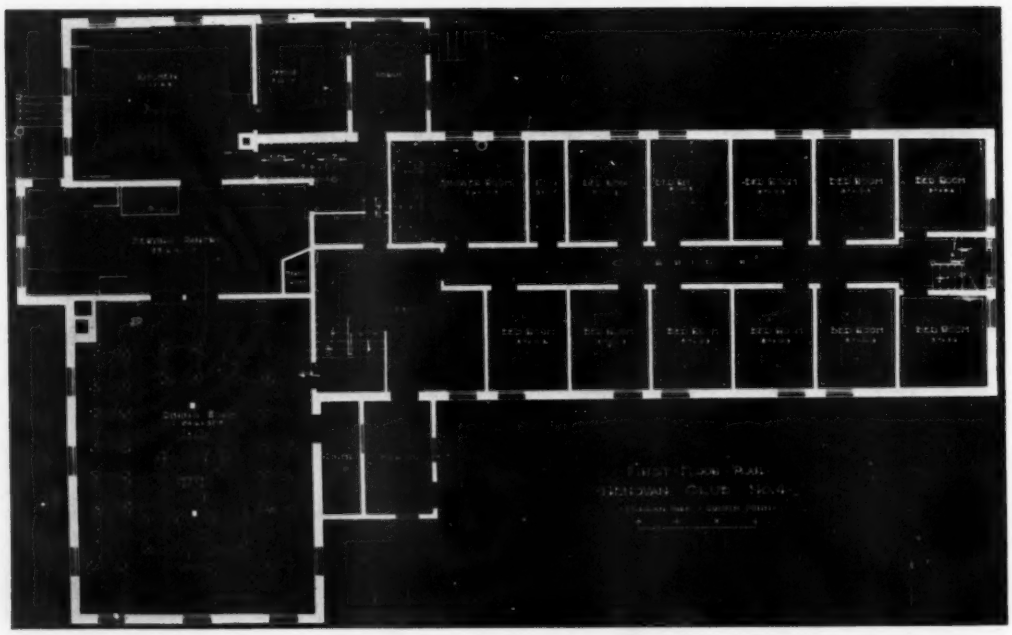
SINGLE HOUSE—FIVE ROOMS

SINGLE HOUSE—FIVE ROOMS

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*





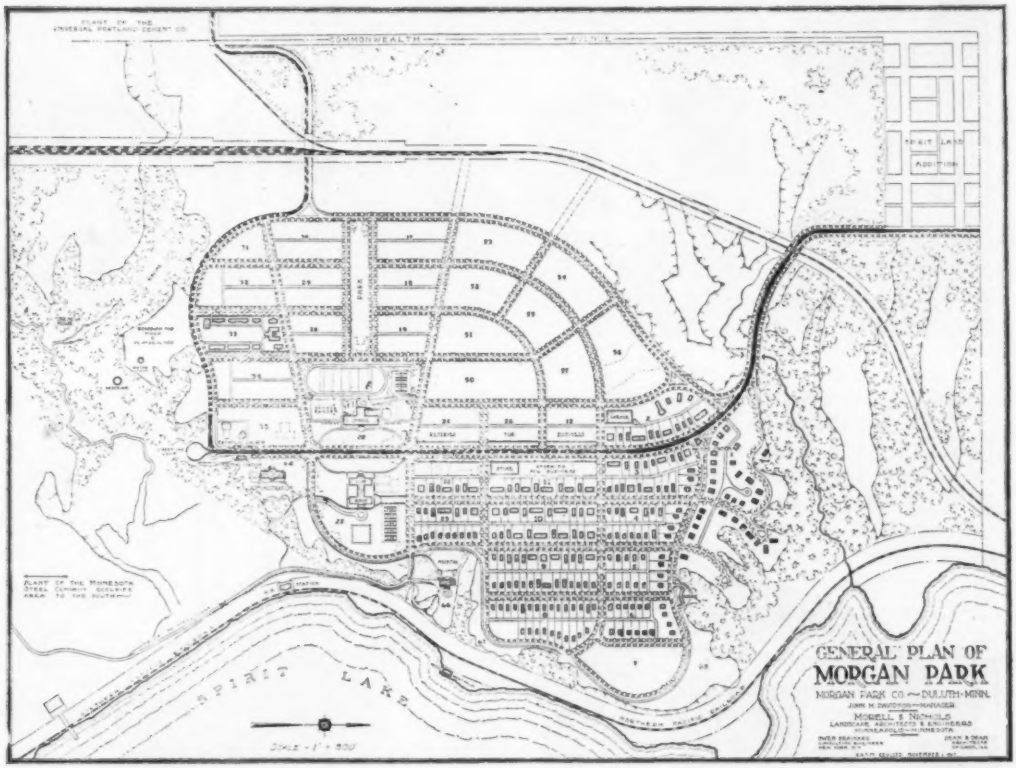
FLOOR PLANS: NENOVAN CLUB—A MEN'S BOARDING HOUSE

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*

locations that has seriously hampered the securing and holding of an adequate and sufficient supply of labor.

Morgan Park is connected with the city of Duluth by street car and railroad lines. It is located on a low plateau overlooking Spirit Lake, an arm of the St. Louis River. The elements of town planning, particularly as affecting the layout of streets, have been simplified by the level character of the ground. No curvature of the streets has been necessary owing to the contours of the land, but merely lines are laid in the alleys, a fire hydrant is located at the curb, in the center of each block. All wiring is underground, and there is an entire absence of poles, with the exception of those used for street lights and trolley wires, and these are treated in an ornamental way. All of the houses and land comprising this suburb are the property of the industrial company, and none of them have been sold. Present and future difficulties in securing an advantageous districting of the town site to observe the proper amenities have been simplified.



as a logically suggested artistic form that would show the natural profile of the lake shore and its ravines. Reference to the accompanying plot plan will show the general layout of the property, the distribution of special blocks for business property, the civic center, with its community playgrounds and parks, and all the various elements of a well-designed community. The houses are either single, semi-detached, or in row types. The often present long and monotonous rows of houses have been avoided.

All public utilities and facilities have been treated in the most modern way. Gas, water and sewage

In a comprehensive description written by Leifur Magnusson, and published by the Board of Labor Statistics of the United States Department of Labor, much valuable information as to this industrial development is presented. We quote in part from this pamphlet as follows:

All permanent houses and buildings in the community are of concrete material, and practically fireproof, except as regards the roofs of the earlier-built houses, which are of cedar shingles. The exterior walls of the better houses are constructed of T-shaped, machine-molded concrete blocks and of hand-molded concrete bricks in the later houses.

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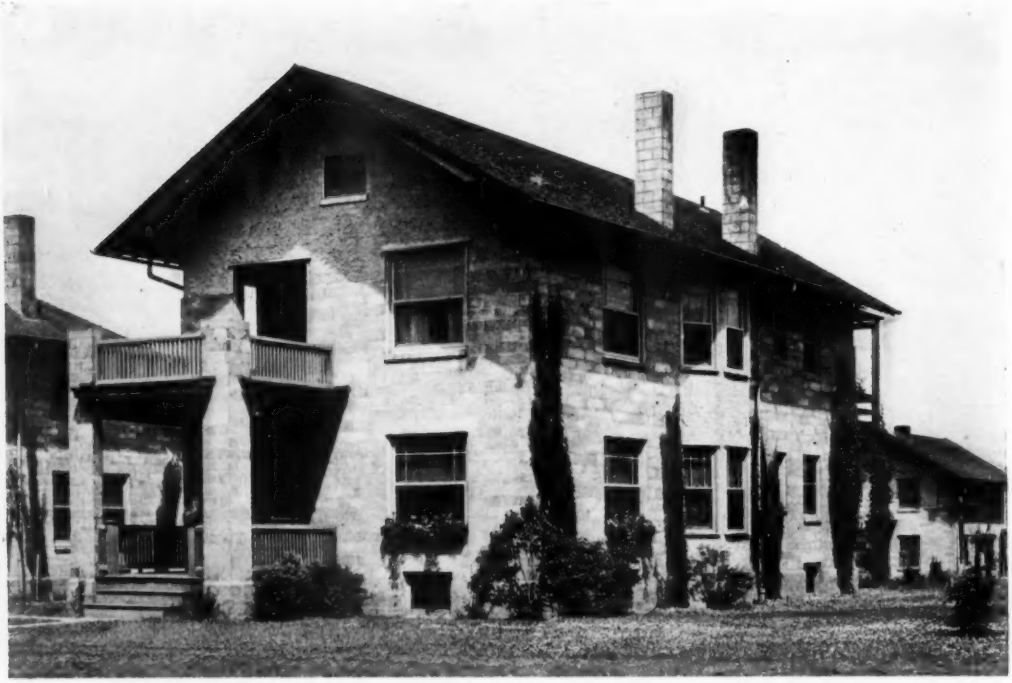
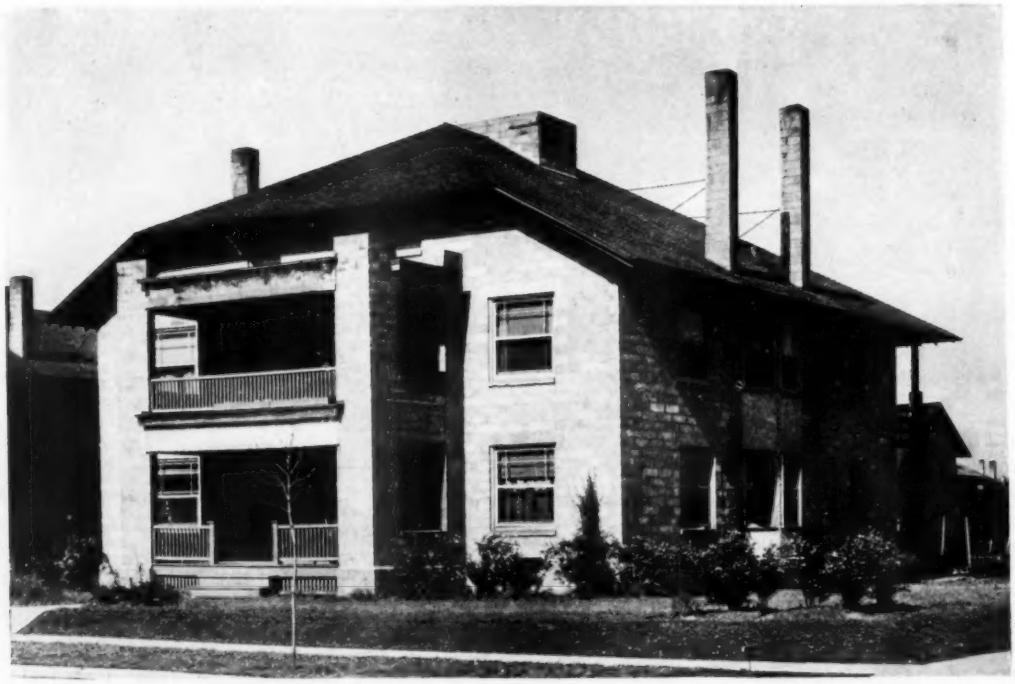


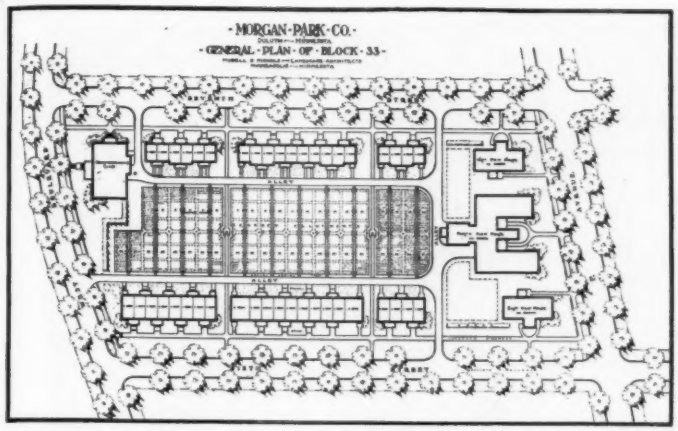
TWO FOUR-ROOM APARTMENT HOUSE



FOUR APARTMENTS—TWO OF 4 ROOMS AND TWO OF 5 ROOMS

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*



The floors are of hardwood, laid over reinforced concrete. The inside walls are plastered and tinted. In the low-rental houses the walls are of stucco on metal lath, and the interior plastered and covered with a special washable fabric which prevents cracking of the plaster; the floors are of cement.

The houses of the better-paid skilled workmen and of the office staff and officials are characterized by variety in architecture and arrangement, by spacious lots with lawns, and by the provision of all modern sanitary equipment. There are altogether 36 types of buildings. There are provided 437 dwellings altogether, of which number 125, or 28.6 per cent, are single detached dwellings, and 312, or 71.4 per cent are either detached flats, double flats, or rows. All of the better class houses have bathrooms, hot and cold water connections, and laundry tubs, and are heated by hot-air furnaces. The houses are furnished with electric-light fixtures, gas connections for cooking, kitchens with sanitary plumbing, and some have fireplaces. With the exception of fireplaces, and furnaces in most instances, some of the low-rental houses are similarly equipped.

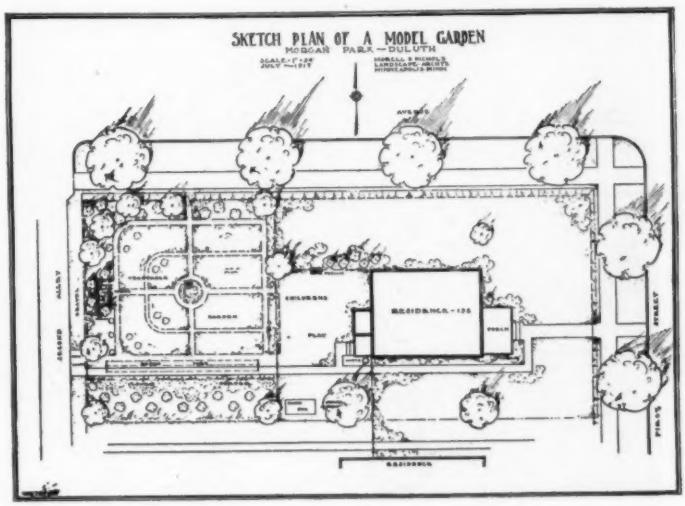
The houses of the skilled workmen, office staff and superintendents are modern improved houses, not differing essentially from what such employees would ordinarily provide for themselves as within their means. All 4-room houses in the eastern section of the town site rent at the rate of $3.75 per room per month, or $15 for the house. All other houses in the original development of the eastern section rent at the rate of $4 per room per month. The newer houses constructed in 1916 and 1917 rent at a slightly higher rate.

The walls of the 349 original houses are constructed of T-shaped concrete bricks, machine molded. The walls rest on concrete footings 5½ or 6 feet below the grade line. Below the grade line the wall is laid of two rows of blocks, staggered and reversed. Above the grade level only one row of blocks is used, and on the inside legs of the blocks one thickness of plaster board is nailed on a furring strip and covered with fiber plaster. An air space is thus made in the wall.

The cellar floors are of concrete, as are also all the other floors. The upper floors are of reinforced concrete laid between the 2 by 6-inch joists. The concrete is poured from above, between these joists, and surfaced so as to expose the joists and permit of nailing to them the wood flooring above and the ceiling boards below.

Four boarding houses have been erected for the clerical force and technical men. They accommodate 74 men. The smallest room in any of these houses is 8 by 10 feet. Special furniture has been constructed for the rooms, so as to secure the greatest economy of space. The clubhouse dining room is also operated as a public dining room, with à la carte and table d'hôte service, to avoid duplication of eating and hotel facilities in the park.

For families of the lower paid or unskilled laborers multiple houses of the row type are provided, and for single men boarding houses have been con-



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GENERAL STORES BUILDINGS, WITH OFFICES ABOVE
MORGAN PARK, MINN., AN INDUSTRIAL SUBURB
DEAN & DEAN, *ARCHITECTS*

FRONT VIEW, GENERAL STORES BUILDING

structed. It should be noted that the row houses are not the ordinary continuous rows, extending unbroken for a whole block, as found in larger cities. They are short rows, or groups, accommodating from four to ten families; each building is therefore a symmetrical architectural unit, and gives none of the monotony of the ordinary row of houses.

These houses, occupied largely by unskilled laborers, are located in a separate block (block 33) in the western half of the town site. Some features of the planning of the block are of interest as showing the thought given by the manager of the company to the housing of the lower paid unskilled laborer.

(1) The alleys are located immediately in the rear of each line of houses, instead of in the center of the block. This reduces the amount of pavement necessary, and is of special advantage in winter because of the shorter lengths of walk to be kept free from snow. It also permits the rear gardens to be individually fenced in and to be kept apart from the house lot proper when not in use.

REAR VIEW OF DWELLINGS

(2) The buildings are arranged on the north end of the block in such manner as to screen from the street the view of the alleys and rear gardens. On the south end a screen of evergreens or lattice-work fences is to be provided.

(3) The boarding houses are kept entirely separate from the dwelling houses by a transverse alley and fence.

(4) The neighborhood house is located on the south end of the block; away from the boarding house, and convenient to the playground and park immediately adjoining on the south.

(5) A separate garden plot is provided for each family.

(6) The part immediately adjoining the dwellings at the rear, and extending to the alley, is graveled and not grassed, as it is believed that it will not be kept up, and hence may prove unsightly. Furthermore, since gutters on the houses are eliminated—to avoid trouble with ice in them in the severe climate—it has been necessary to prepare the ground to withstand wear from water drip.

The block provides for 42 families, one-half of which it is estimated may accommodate an additional boarder, though this practice is not encouraged, and 116 employees are estimated for the boarding houses. This makes a total of 179 employees to be housed in the block. The minimum population of the block will be about 280, the maximum probably 350.

The frames of the houses are of wood, and the roofs of frame overlaid with roofing boards, waterproof paper, ventilating strips and wood shingles. The floors are of reinforced concrete colored with pigment. The exteriors are of cement plaster, or stucco, on galvanized-wire lath, backed up with waterproof paper and plaster boards laid on the studs. The inside walls are plastered, and covered

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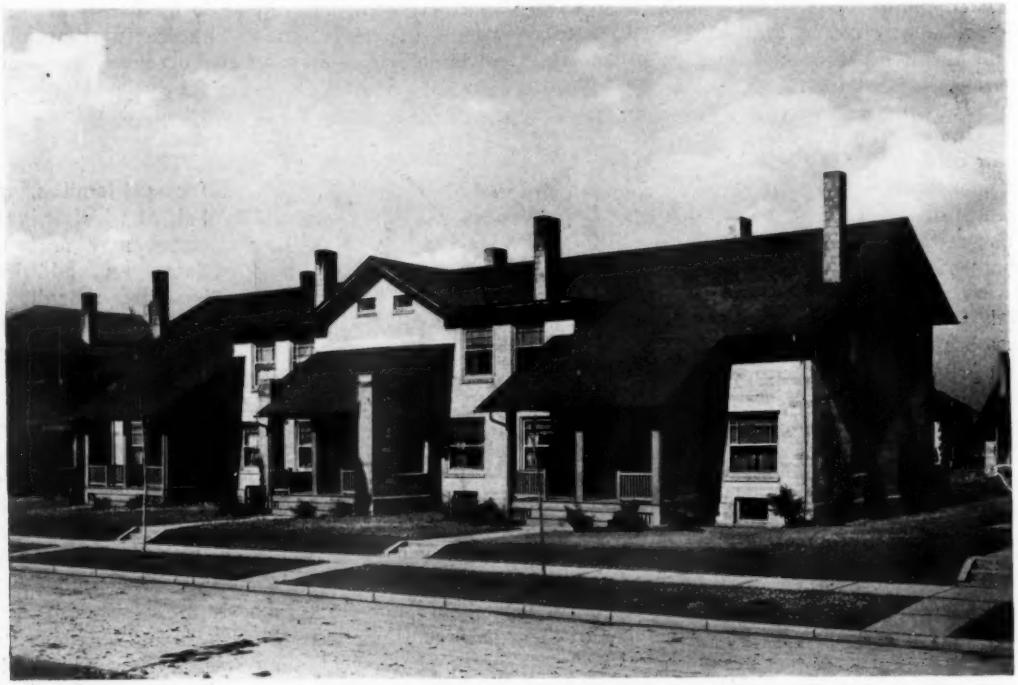
GENERAL STREET VIEW, SHOWING DETACHED HOUSES



A SIX-FAMILY TERRACE GROUP

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*

A PRIZE VEGETABLE GARDEN

with a special strong, durable and washable fabric. The first floors are raised above the ground enough to secure an air space to insure dryness and to avoid frost trouble.

Certain special features of these houses should be noted. The bedrooms are large, and have but one door in each, thus making provision for good housing standards should any of the families keep boarders.

The kitchen is large, so that it may be used also as a dining room. The living room, in some cases, is separated from the kitchen by a partition and door; in others the two practically form one large room occupying the entire first floor. This latter is a feature strongly recommended by the manager of the company. The majority of the houses are stove heated, as the manager feels that the type of labor to be housed may prefer stoves to the more elaborate or complicated furnace heating; also that the provision of both arrangements in otherwise similar types of houses in the same block is a valuable experiment.

The placing of coal bins on the rear porches of those houses which have no basements makes it possible to store a fuel supply on the premises without overcrowding the kitchen or necessitating coal sheds on the rear of the lots. These bins will hold approximately a half-ton of coal. This feature is of particular importance because only eight of the houses in this low-rental section have basements. A latticework on the porches at the rear is contemplated to avoid the usual objectionable and untidy appearance of such porches resulting from their general use as storage and "catch all" places for ice boxes, washing machines, dishpans and other kitchen and household appliances.

The housing company lays great stress upon the importance of so designing the kitchens that the walls may be used to the greatest extent possible for the storage of food, utensils and china, thus conserving floor space for other purposes. This is

PRIZE GARDENS

FOUR-FAMILY TERRACE HOUSES

TYPE 16-B—SINGLE HOUSE, SIX ROOMS

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

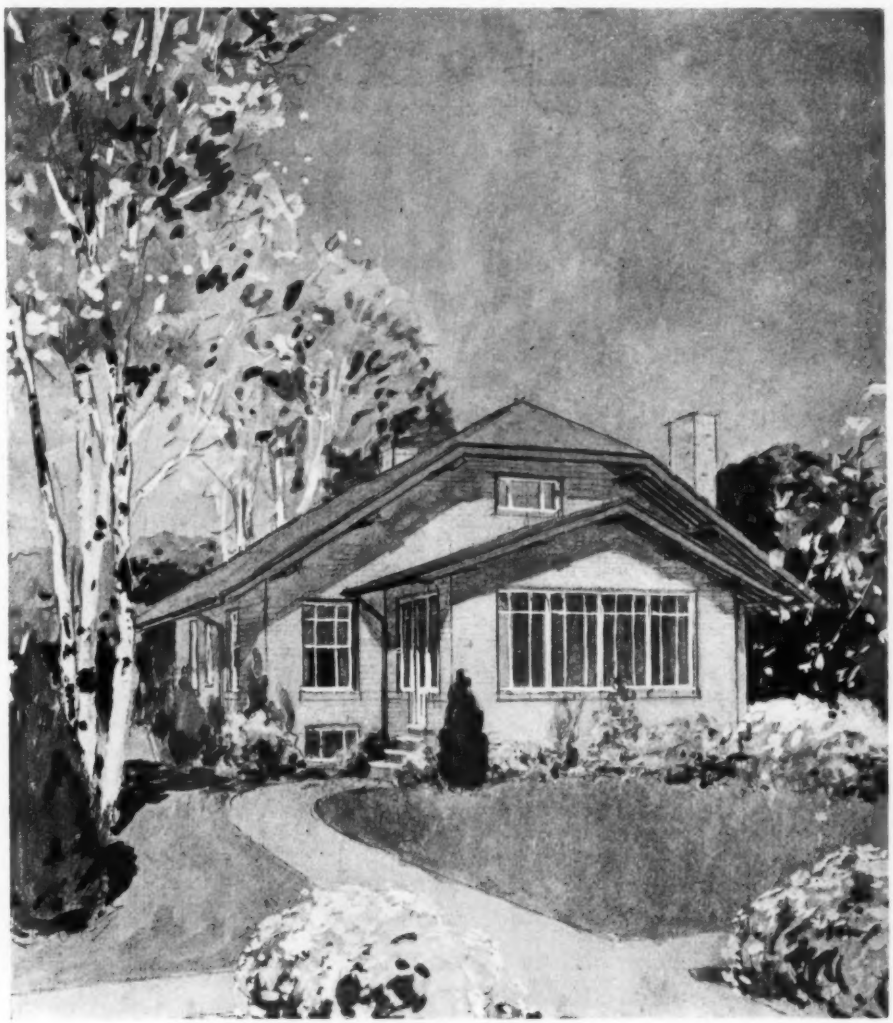
DEAN & DEAN, *ARCHITECTS*

considered especially necessary where the houses are compactly arranged to save building cost and permit of low rentals, and where basements are dispensed with.

There are 42 dwellings provided in the form of row houses; that is, buildings containing four or more dwellings side by side. Each dwelling is provided with a three-piece bathroom, kitchen sink and laundry tub—combination laundry tub and sink in the kitchens of those houses without basements—and a hot-water tank connected with the stove. All houses are electrically lighted.

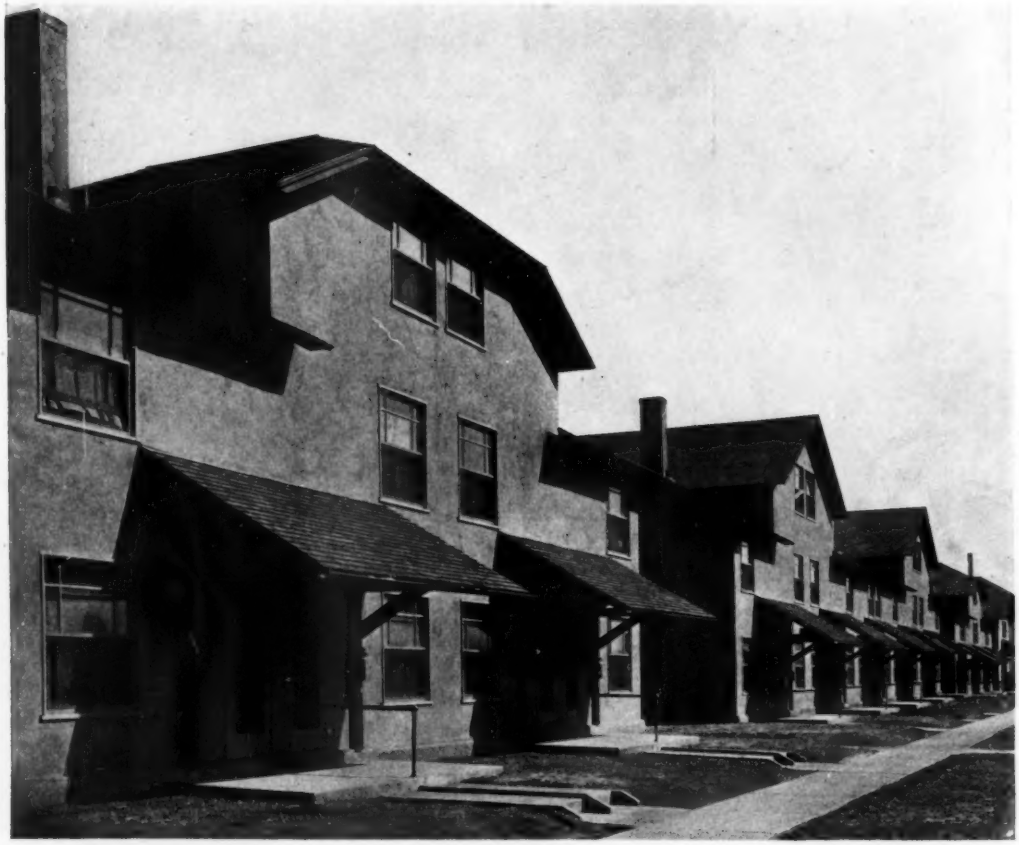
The cost of erecting these houses for the low-paid, unskilled laborer averages about $400 per room, not including the bathroom as a separate room. The 42 dwellings were built under a single contract in 1916 and 1917.

Of the 42 dwellings, 26 contain 4 rooms per dwelling, and, of the 26, 12 are heated by stove, and rent for $10 a month; 12 are heated by furnace, placed on the first floor, and rent for $11 a month; while two, having a basement and furnace, rent for $12 a month. Fourteen of the 42 contain 6 rooms each. Eight of these 14, heated by stoves, rent for $15 a month; four, having furnace heat, rent for $16.50; and 2, each of which has a basement and is heated by a furnace, rent for $18.75 per month. The two remaining dwellings, in the



HOUSE TYPE 15-H

TYPICAL GROUPING OF VARIOUS TYPES



A STREET IN BLOCK 33

MORGAN PARK, MINN., AN INDUSTRIAL SUBURB

DEAN & DEAN, *ARCHITECTS*

GROUND FLOOR OF TYPICAL DWELLING

form of a double house, provide five rooms for each family unit, are heated by furnace and rent for $13.75 per month per family.

Three boarding houses for the single men have been erected in the low-rental block described above. Two of these are identical in plan, except that one is the reverse of the other. Each of the last named accommodates 16 boarders in 8 double rooms and 9 in single rooms, together with 7 rooms for the family or administrative staff engaged to operate the house. The larger boarding house accommodates 44 boarders in 22 double rooms and 22 in single rooms. Sixteen rooms are provided for the caretaker of the house and for administrative purposes. Single rooms are 8 feet 3 inches by 10 feet 8 inches, and double rooms generally 11 feet 3 inches by 10 feet 8 inches.

The construction of the boarding houses is the same as of the low-rental houses; i. e., cement stucco on wire lath, backed by waterproof paper and plaster board. All floors are of concrete, some of the floors being covered with a top flooring of maple; roofs are similar in construction to those of the dwelling houses; the interior finish is of painted pine, and walls are wood-fiber plaster on plaster board. Modern plumbing is installed throughout, and the houses are heated by hot-air furnaces and lighted by electricity.

In the smaller boarding house, the dining room, kitchen, living room, wash and toilet room, furnace room and a storage room are in the basement. There are also a toilet room and a living room for the management, on the first floor, but none on the second floor.

In the larger boarding house the basement contains the furnace room, laundry and storage room.

All boarding-house washrooms have shower baths, washbowls with "flowing-stream" faucets, liquid-soap dispensers, sanitary drinking fountains and toilets.

Each wing on each floor has independent toilet and washing facilities. Each wing, furthermore, is entirely isolated from the other by the central dining room on the first floor and the recreation room on the second floor; both of the latter are reached by an outside entrance, so arranged that every person entering the dining room or recreation room must pass the custodian's office. The kitchen and the servants' quarters are arranged in such a way as to secure complete isolation from the remainder of the building except through the dining room. The custodian has an office, a bedroom, and a toilet in connection. The dining room will seat all of the boarders at one time. The recreation room, on the second floor, above the dining room, is of the same size as the latter.

The welfare building, or neighborhood house, as it is called, is designed to be the center for neighborhood recreation. The building is of the same construction and appearance as others in the block. It contains a small store, where special foreign goods and foods are sold, a barber shop, and a neighborhood nurse office. There is a lounging room for the men and a meeting room for the women, completely separated, and having ready access to the nurse's office. The second floor is principally one large recreation room, which may be used for entertainments, lectures, dances, etc., with equal facility, and a kitchen attached thereto for conducting cooking classes for the women and children of the section and for use in connection with entertainments. The basement is devoted principally to classrooms or reading rooms, in order to give the maximum degree of quietude.

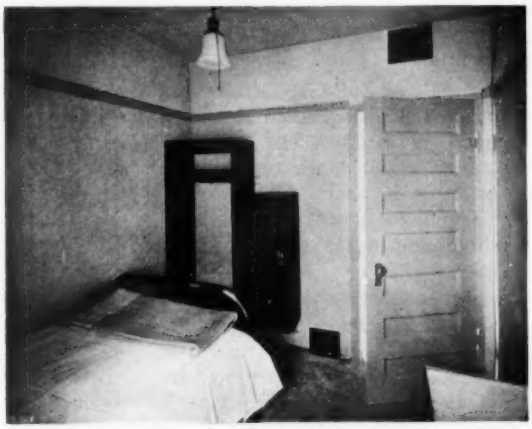
The entire building was designed to permit the

ANOTHER VIEW OF GROUND FLOOR OF A TYPICAL DWELLING

XUM

greatest "elasticity" in its use; that is, any one or more of the rooms can be used for several purposes, thus allowing the use of the building to change from time to time as the personnel or requirements of the adjacent residents demand.

The houses of the community are rented only to employees of subsidiary companies of the United States Steel Corporation in the neighborhood and persons doing professional and mercantile business in the park. No houses are sold. As noted, all types of employees are reached, although only to a limited extent. The Minnesota Steel Co., for whose employees the community was primarily established, employs, in round numbers, about 3000



TYPICAL BED-ROOM IN BOARDING HOUSE

persons; the Universal Portland Cement Co., some 450; and the Morgan Park Co., about 50; as yet, only about 750 employees altogether are accommodated in the company town, including the boarding houses.

The tenants for company houses are selected generally in the order of their application. Other considerations may, however, have weight in the matter, such as the character of the applicant's services, his general desirability as a tenant, and the likelihood of his becoming a permanent employee.

An information card is kept of each tenant, which shows the make-up of his family, and information concerning his past rental record.

Rent is collected once a month. The subsidiary companies whose employees are housed generally collect it by a deduction from the pay of the employees, upon their written request, and turn it over to the housing company. Employees requesting it, certain of the administrative staff, and non-employees, pay rents at the office of the company, as in common house-renting practice.

A rental lease is signed for such terms as may be agreed upon. It does not, as is common in many company leases, contain a provision to the effect that the lease is for the term of employment only, but does provide that notice to vacate in 30 days may be given.

The residents of the suburb are kept interested in their community by being informed, through circular letters, pamphlets, and a weekly bulletin, as to different phases of management—how to garden, how to take care of their furnaces, how to manage their water supply—keeping their lawns trimmed and premises neat, community recreation and entertainments, together with announcements of all social, religious and educational events. Articles are contributed to the weekly bulletin by physicians, school teachers, neighborhood nurse, agricultural experts, physical and recreation directors of the clubs, and officials of the local athletic and social organizations.

Many of the building projects in Morgan Park, as well as certain features of its social life, have been approached in an experimental manner. The factors in modern town-planning science as applied to industrial towns can be ascertained accurately, the manager believes, only in that manner. Town planning in the sense here used applies to the whole

(*Concluded on page 761.*)

TYPICAL BATH-ROOM IN DWELLING

THE AMERICAN ARCHITECT

Founded 1876

PUBLISHED EVERY WEDNESDAY BY
THE ARCHITECTURAL AND BUILDING PRESS, INC.
No. 243 West Thirty-ninth Street, New York
E. J. ROSENCRANS, PRESIDENT AND TREASURER
WILLARD C. HOWE, VICE-PRESIDENT

JAMES KNOX TAYLOR—WILLIAM H. CROCKER
Editors
ARTHUR T. NORTH, Engineering Editor

Subscriptions in the United States and Possessions, Mexico and Cuba, TEN DOLLARS. Other Countries, TWELVE DOLLARS
SINGLE COPIES (Regular Issue) 25 CENTS

CHICAGO OFFICE, Mallers Building
Page A. Robinson, Western Manager
ST. LOUIS OFFICE, Wright Building
CLEVELAND OFFICE, Guardian Building
SAN FRANCISCO OFFICE, 320 Market Street

Owned by United Publishers Corporation—H. M. Swetland, President; Charles G. Phillips, Vice-President; W. H. Taylor, Treasurer; A. C. Pearson, Secretary. Entered as second-class matter January 6, 1909, at the Post Office at New York, New York, under the Act of March 3, 1879.

VOL. CXIII JUNE 5, 1918 NO. 2215

Taking Time by the Forelock

OF all the allied nations, the United States alone is thus far free from the ravages of war. The devastation which has befallen France and Belgium is appalling. We use words to indicate the terrible things that have happened in the theater of the war, but those who have returned to this country tell us that words fail to describe the horror of it all.

Just now when all available fighting men in France and Belgium are under arms, and their care and support devolve on their respective governments, there is no question as to the rehabilitation of those wide areas which have been devastated. The whole intent and purpose of these nations and all of their people is to repel the enemy and regain their sadly diminished heritage.

But when all this strife has ceased, it will at once become necessary to set about the upbuilding of these countries and to restore as far as possible the original aspect of the land. The necessity for adequate housing will at once become acute, and the demand for thousands of varieties of material for use in construction will be imperative. The only parallel we can find is in those large cities in this country and in Europe where conflagrations have swept vast tracts. We are familiar with what has happened in every instance. We know that in most cases there has been a hurried rebuilding, without any well-devised scheme to correct errors of planning and construction. Necessity has ruled, and the city has had to provide at once adequate shelter for a large homeless population. Fortunately, however, for the future development of France and Belgium, a long period is elapsing during which it is possible for these Governments to prepare a rebuilding scheme whereby every error may be avoided.

In this country well-meaning daily papers and numerous organizations have endeavored to create funds or to secure services of architects with a view to entering on some scheme which would enable the United States to participate in rebuilding Europe after the war. But, fortunately, the counsel of wiser heads has prevailed, and it is sensibly left to France, as more capable, to plan and execute her own schemes for rebuilding.

However, an opportunity is being created whereby the United States will be enabled to play an important commercial part in these vast building operations. It is not conceivable that Europe will be able to supply from the outset even a small part of the great quantity of building materials necessary.

Certain immediate requirements of basic materials are foreseen and supplies may be created with almost perfect accuracy and safety. Will this country be ready to meet this demand, or will it hold off the accumulation of stocks until other countries will have gained these markets?

Probably there has been no time since these United States first existed when opportunities so large could be so easily availed of. Even now our allies are beginning to organize for the trade rivalry which will undoubtedly exist when peace is declared. Even now, in South America, that common fighting ground for commercial extension, the European nations are conducting well-organized campaigns, so that when the opportunity shall arrive there may be no period of initial inaction which may be taken up and worked to the advantage of trade rivals. Just how far our own Government is acting to secure its just share of the immense demand that will occur with the declaration of peace is not apparent. It is folly, however, to treat all these things lightly and to be "caught napping" when the time arrives.

The immense tonnage now building along our seaboard will, with peace, have served its purpose and will be largely available to carry, and quickly, the many cargoes which will be awaiting transshipment. It is easy to see that the great flood of merchandise to be freighted may, in time of peace, create as great congestion, even with the increased

number of ships, as was found during the early months after our entry into the war.

The wisdom of the saying "in time of peace, prepare for war" is no greater or truer than its paraphrase, "in time of war, prepare for peace." Are we preparing for peace? Are those engaged in the many branches of the manufacture of material used in building construction preparing for the future?

Is it difficult to understand why there will be an unusual and an insistent demand? Is it hysterical to declare that no greater commercial disaster can confront us than a condition of unpreparedness for the great opportunity when it comes?

This war has demonstrated the value of preparedness. It has served to show us that a supine and inert attitude toward complete readiness for every conceivable emergency is no less than a national crime. Let us be up and doing, for if we ignore the warnings that are being sounded the fault is wholly our own. Let us have our share in the markets of the world as the reward for our share in the battles waged to make them free. When we have secured our aim, the freedom of the seas, let us be ready to use that freedom to our best advantage.

The War and School House Planning

ONE of the things we shall have to consider when this war is over is the question of educational methods. There are many who claim that present-day methods are all wrong. Like other irresponsible critics, they can tear down, can discard the results of years of experience and the most thoughtful consideration, but none of them can suggest a course that will avoid all objections.

The very element of uncertainty as to the future, or, per contra, the element of certainty that there must be reconstruction and reorganization of every branch of our educational system, makes it imperative that we give careful consideration to the more important elements affecting educational methods.

This question of education is one which will greatly interest architects, particularly those who specialize in educational buildings. The modern school as perfected at the outbreak of the war was, as far as human skill could devise, a building perfectly planned and equipped for all the needs from the lowest grade to the many types of high schools.

Yet with all this perfection, the war has developed phases that will so seriously affect future educational methods that even the most perfectly appointed school of two years ago will be found lacking in essential details to provide for the new form of education. It will be interesting to learn what are the most important of the new conditions affecting the planning of future schools. Vocational and pre-vocational schools will undoubtedly be more largely developed than ever before. These schools have now passed through the experimental stage and their value in providing practical knowledge to fit boys and girls for the serious work of life has been proven conclusively.

Much of the work in preliminary training that the Army and Navy have been obliged to undertake to fit enlisted men for particular work, not always technical, will be made a part of the vocational training in future schools.

It is reasonably sure that the arts of peace will not alone receive attention in the educational program of the future. It is reasonably sure that there will be universal military training, not so much as a measure to provide for possible wars, but because it has been conclusively shown that the training and discipline of the cantonment has transformed a lot of anæmic men into sturdy, well-poised soldiers and citizens. It is therefore probable that the future high school buildings will become in a sense an armory for the military training of its students.

Another factor influencing the development of the vocational school is that now known as the "re-education of the adult." Every nation at war has learned that unless it shall assume the burden of the support of a vast number of crippled men, it must provide schools wherein they may be educated in new means of earning a living in their incapacitated state. And the necessity for such provision will cause schools of this type to be at all times a valuable measure and a wise provision on the part of every municipality.

Further, except in the case of students who expect to engage in pedagogy, or in scientific pursuits, there will be a large curtailment in what are now believed to be non-essential studies. Education, as provided by the future courses of study, will undoubtedly be based on the most practical aspect of life and directed solely toward the development of men and women who can, with the least possible delay, be welded into a large and efficient army.

There are other directions where war will influence the general scheme of education. The difference in the curriculum of boys and girls respectively will be less marked in many respects than is now the case. The call for man power in this war has served to cause a cessation of certain classes of labor until women could be trained to do the work. We shall witness the highest development of co-education, and we shall come to regard as a part of the necessary measures of public safety that girls shall learn many of the crafts that have heretofore been confined to the education of boys.

Morgan Park, Minn.

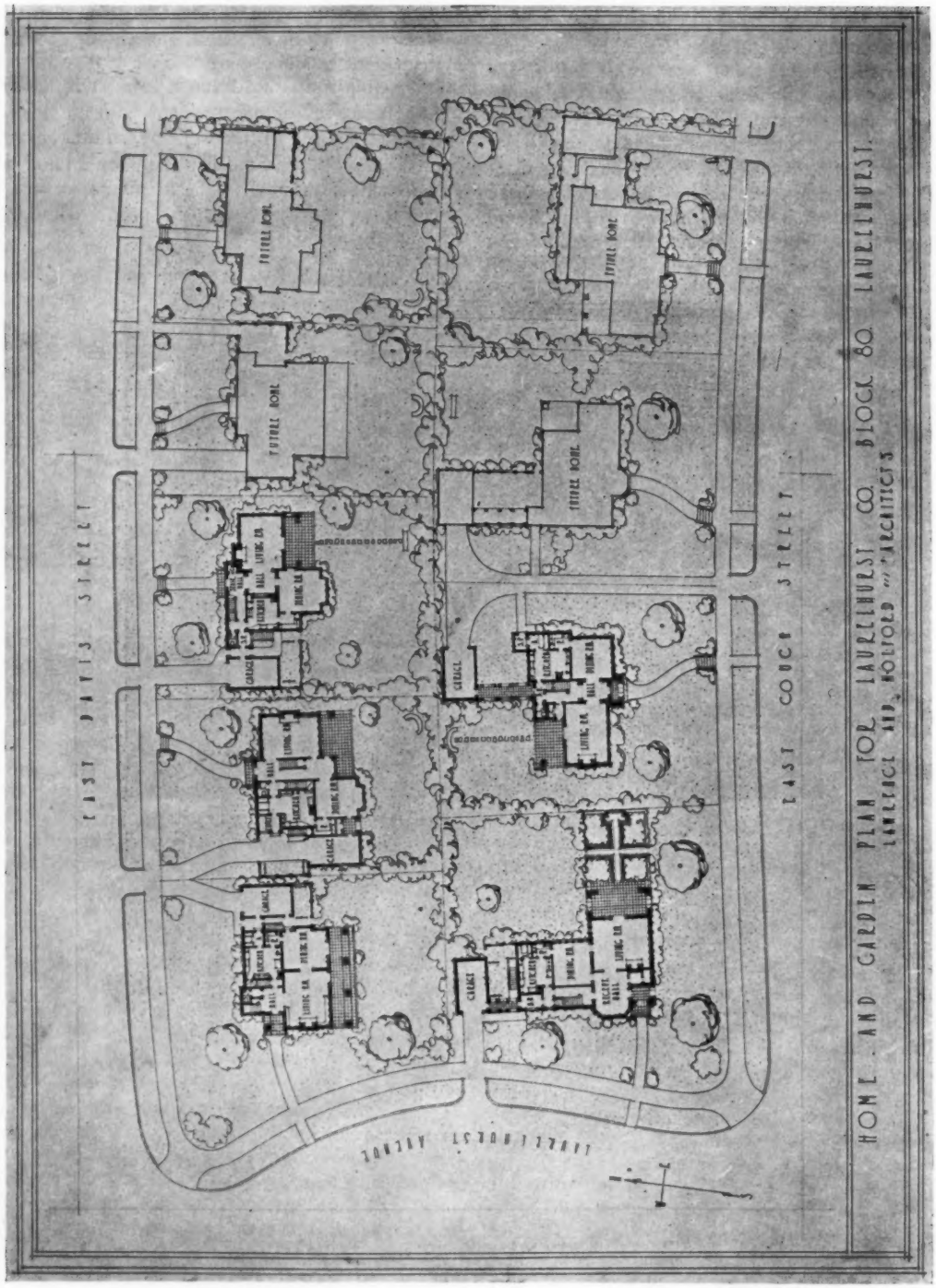
(*Continued from page 758.*)

social structure rather than to the narrower field of building construction and town site surveying only.

One of the considerations worthy of note is the attempt to avoid unnecessary duplication in buildings provided for educational and religious purposes, boarding facilities for single men and women, public service and social and recreational organizations. Duplication in small store facilities has been avoided. Another is the endeavor to stimulate and direct gardening, playground activities, outdoor and indoor amusements for children and adults, public entertainments, domestic science, night school work, and hygienics. And a third is the attempt to assist the residents of an industrial town under company management in developing a civic league or community club to take an interest in matters concerning the relations of one resident with another and their joint relation to the company, so that company control may be exercised to the minimum and self-government developed to the maximum degree believed to be consistent with the proper administration of the property.

TYPE 18-F

XUM


HOME AND GARDEN PLAN FOR LAURELHURST CO. BLOCK 80 LAURELHURST.
EAST DAVIS STREET
EAST COUCH STREET
LAURELHURST AVENUE
FUTURE HOME
GARAGE
LIVING RM.
DINING RM.

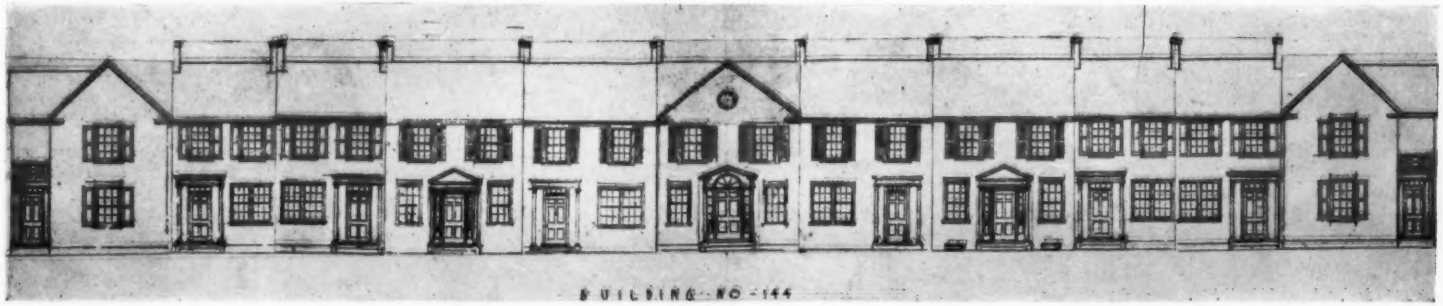
A SUBURBAN DEVELOPMENT
LAURELHURST,
PORTLAND, OREGON

LAWRENCE & HOLFORD
ARCHITECTS

TYPICAL HOUSES

TYPICAL HOUSES

A SUBURBAN DEVELOPMENT
LAURELHURST, PORTLAND, OREGON
LAWRENCE & HOLFORD, *ARCHITECTS*



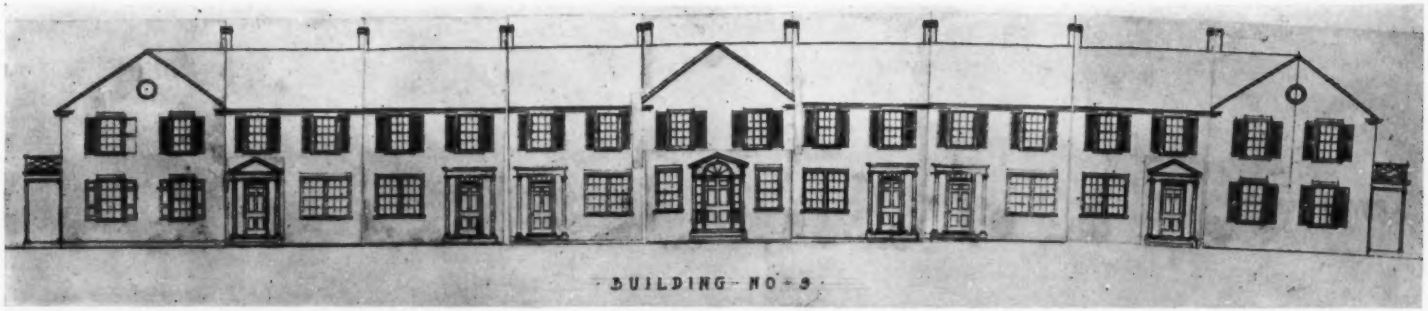
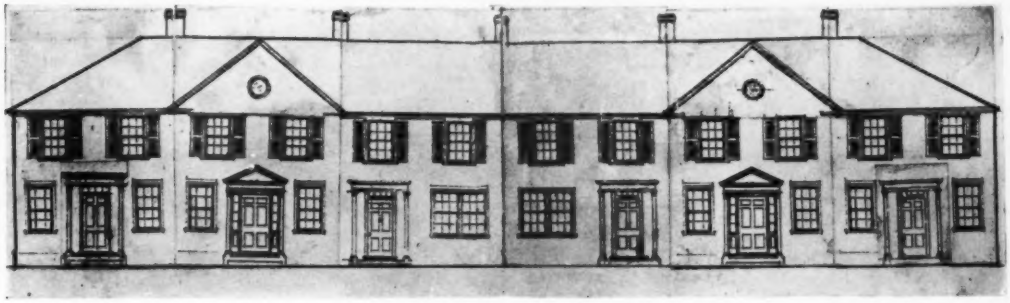


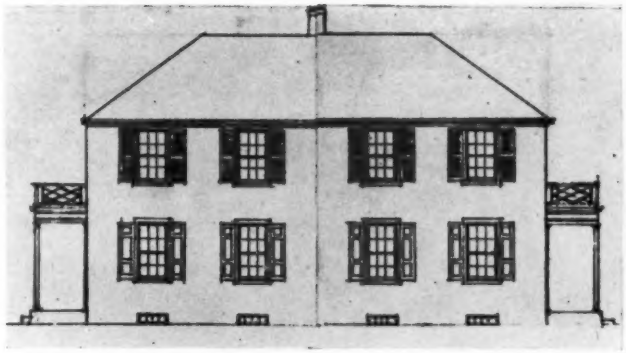
PLATE 195 TYPICAL HOUSES—YORKSHIP VILLAGE.

HOUSING DEVELOPMENT FOR NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

ELECTUS D. LITCHFIELD, *ARCHITECT*



BUILDING NO. 198.



BUILDINGS NOS. 101, 185, 100, 214, 212, 196, 70, 73, 63, 65, 164, 223, 224, 16, 51, 81, 48, 118, 87, 227, 217, 219, 79.

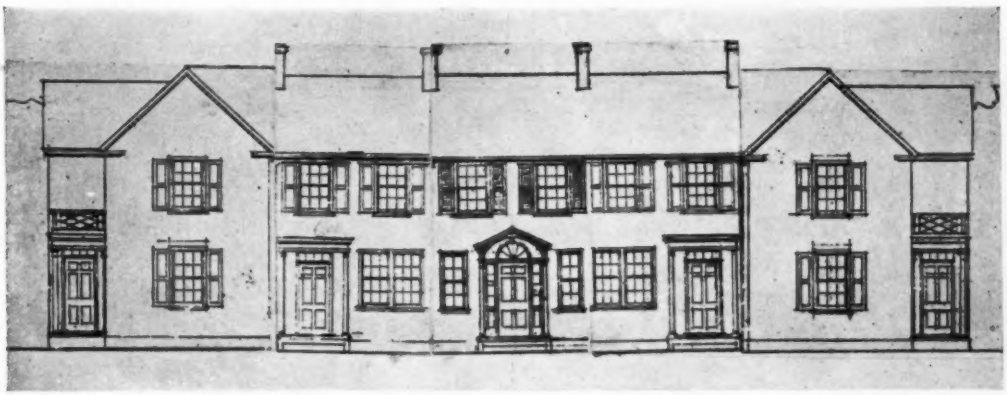
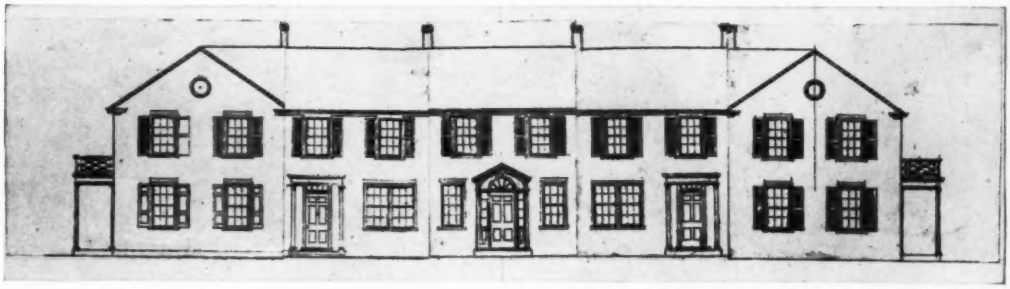


PLATE 196

BUILDINGS NOS. 237, 103, 57, 138.

TYPICAL HOUSES, YORKSHIP VILLAGE, HOUSING DEVELOPMENT FOR NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

ELECTUS D. LITCHFIELD, *ARCHITECT*



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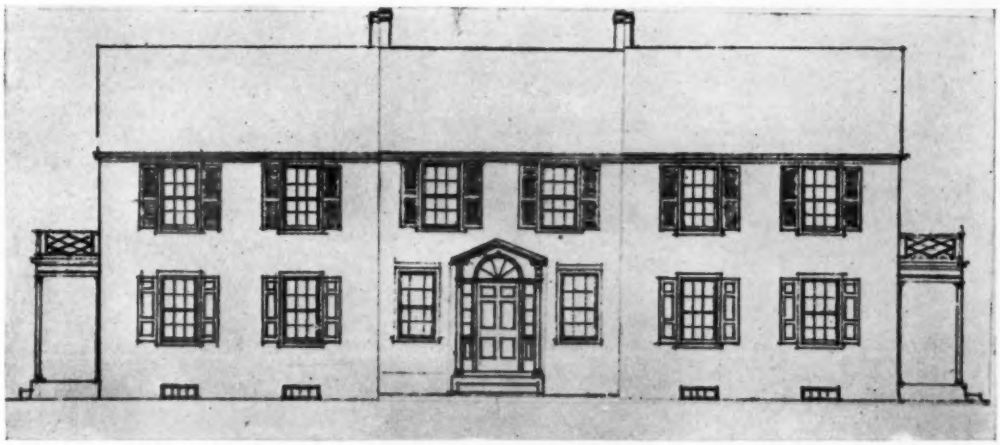


BUILDINGS NOS. 202, 102, 117.

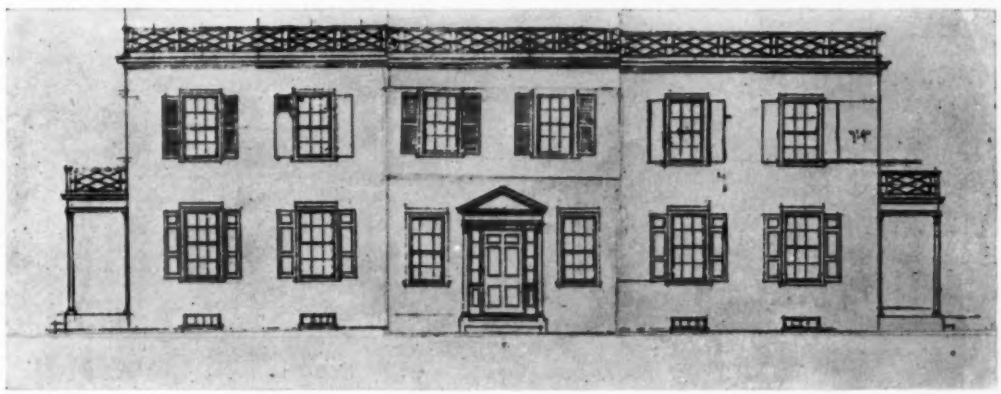
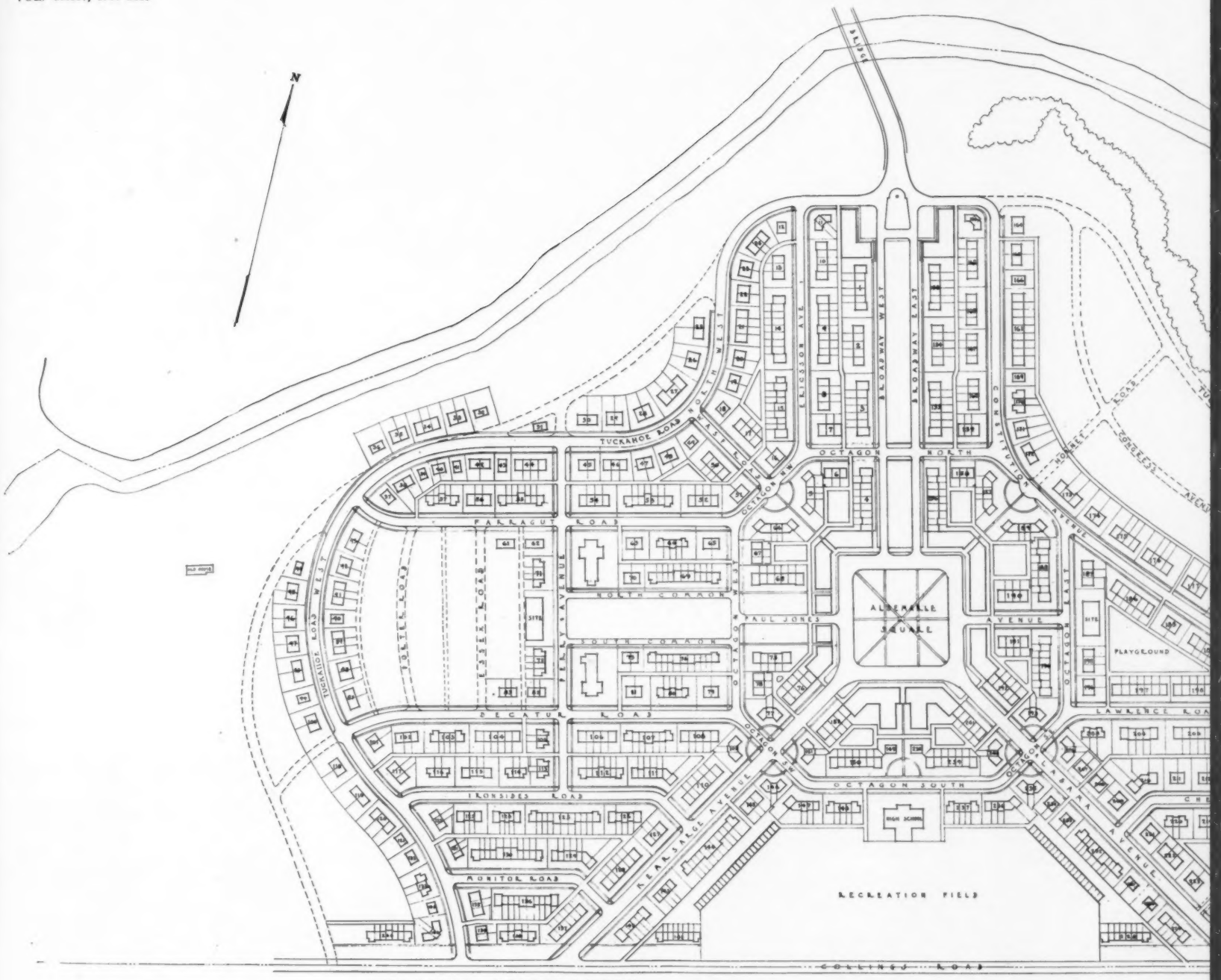


PLATE 197 BUILDINGS NOS. 34, 89, 91, 177, 178, 187, 195.

TYPICAL HOUSES, YORKSHIP VILLAGE, HOUSING DEVELOPMENT FOR NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

ELECTUS D. LITCHFIELD, *ARCHITECT*

XUM



· HOUSING · DEVELOPMENT
FOR
· NEW · YORK · SHIP BUILDING · CORPORATION ·
· NEAR ·
· CAMDEN · NEW · JERSEY

YORKSHIP VILLAGE

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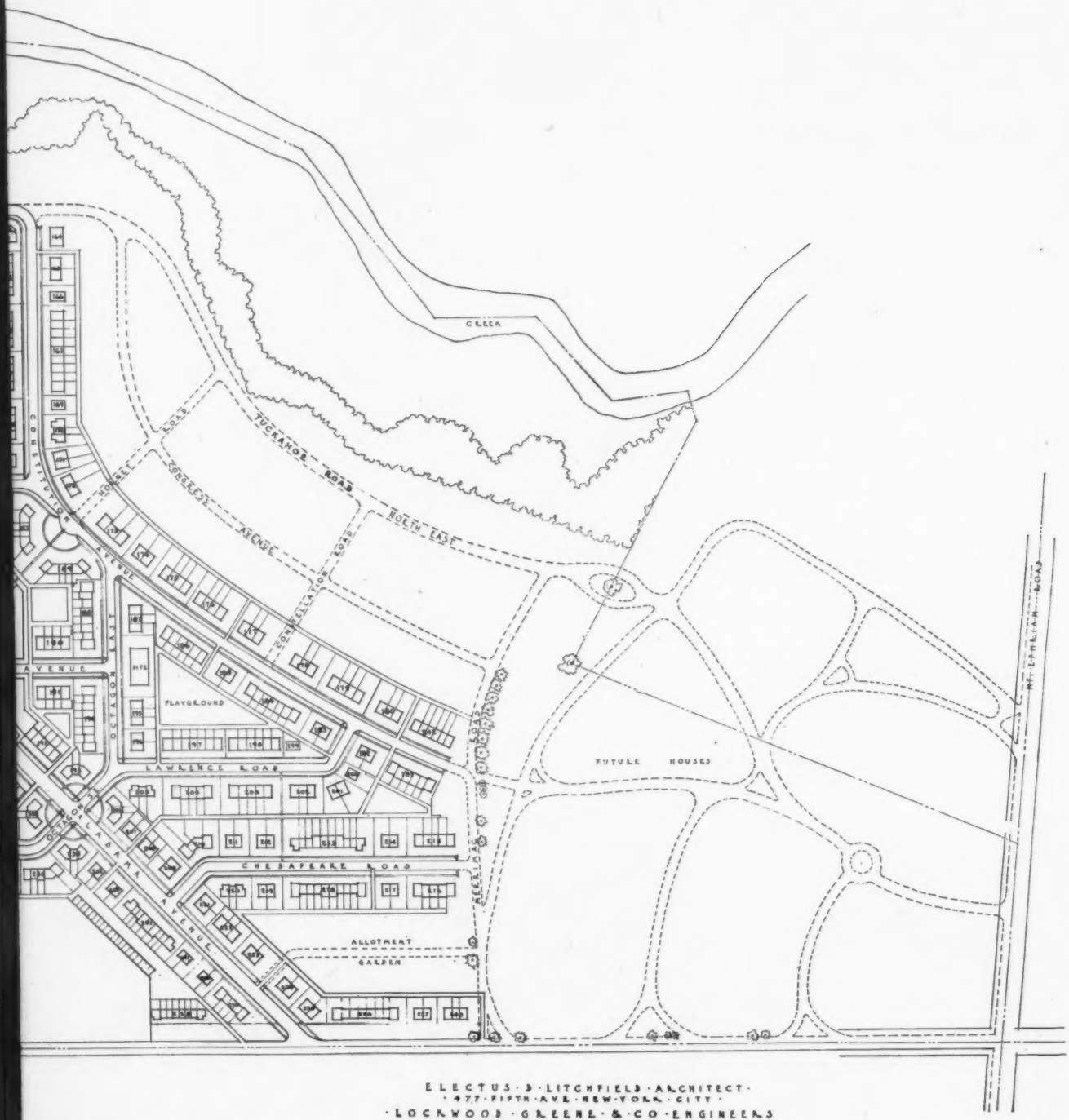
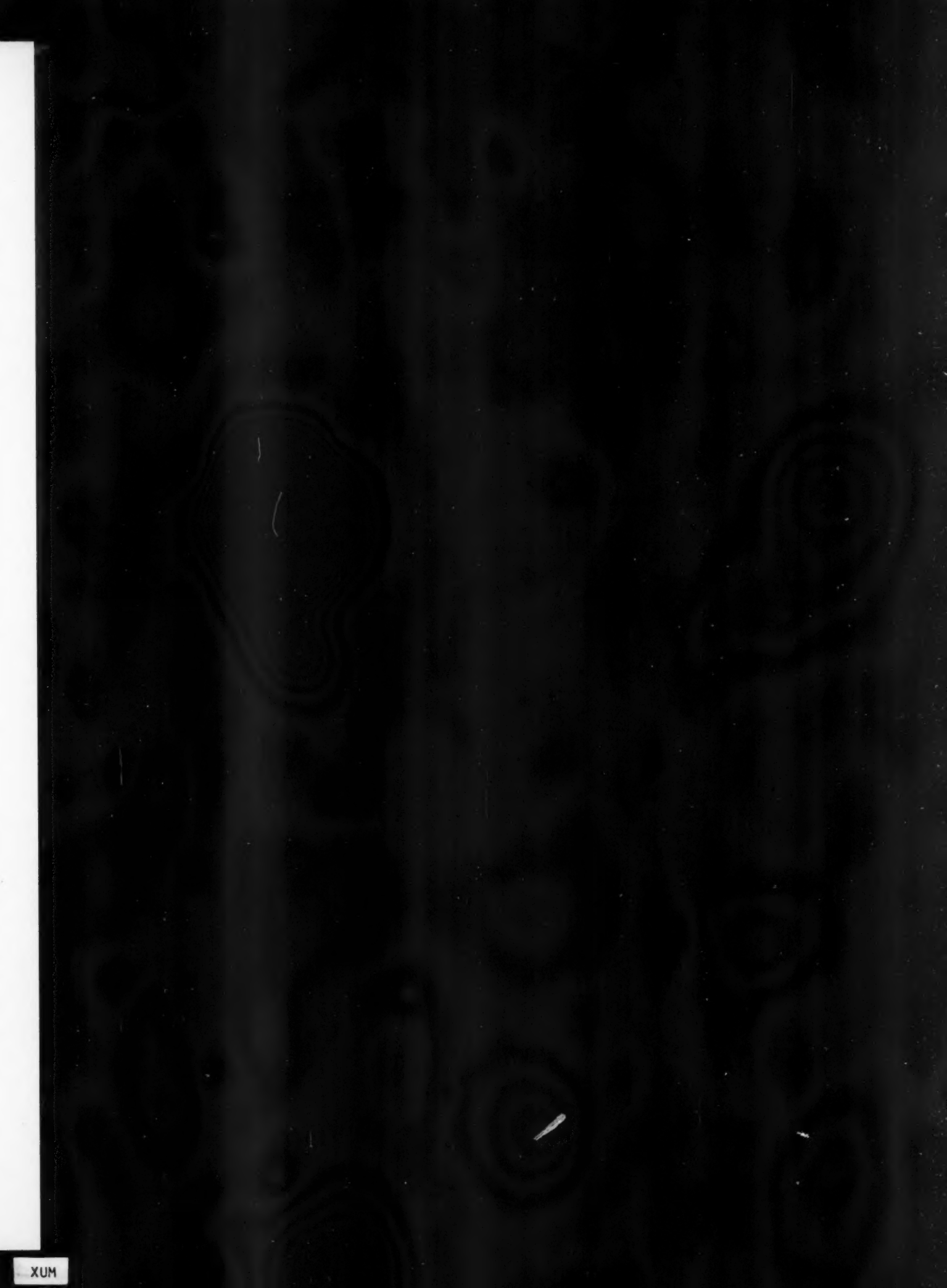


ELECTUS · B · LITCHFIELD · ARCHITECT ·
· 477 · FIFTH · AVE · NEW · YORK · CITY ·
· LOCKWOOD · GREENE · & · CO · ENGINEERS ·
· 101 · PARK · AVE · NEW · YORK · CITY ·

VILLAGE



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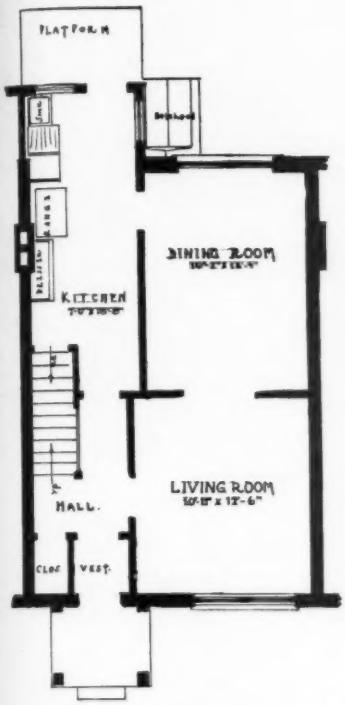
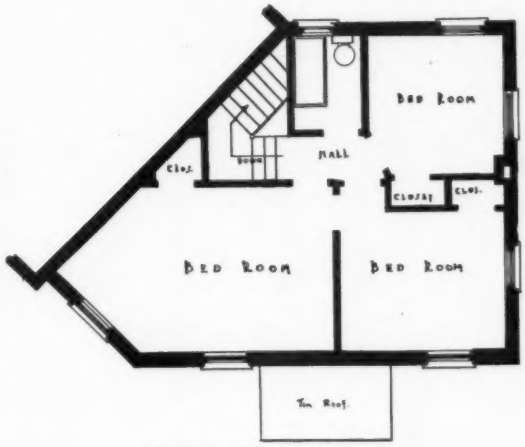
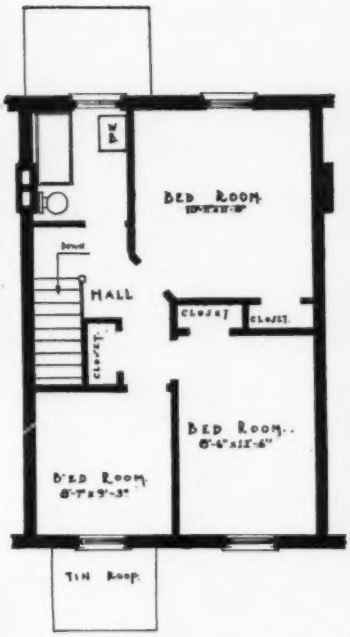


FIRST FLOOR—TYPE Y-B.



SECOND FLOOR—TYPE W.



SECOND FLOOR—TYPE Y-B.

SECOND FLOOR—TYPE W.

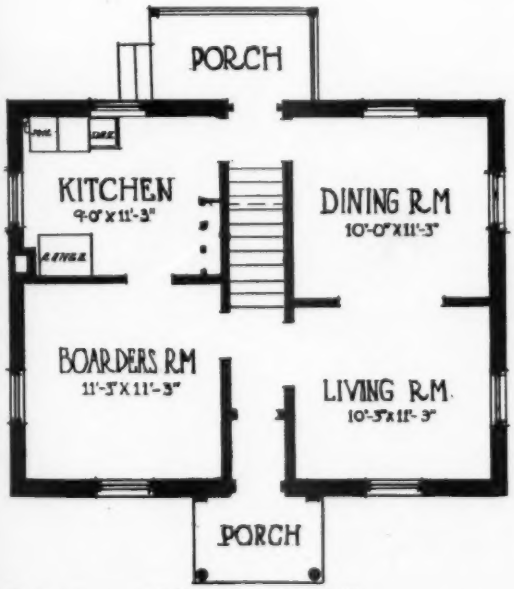


PLATE 199 FIRST FLOOR—TYPE N.

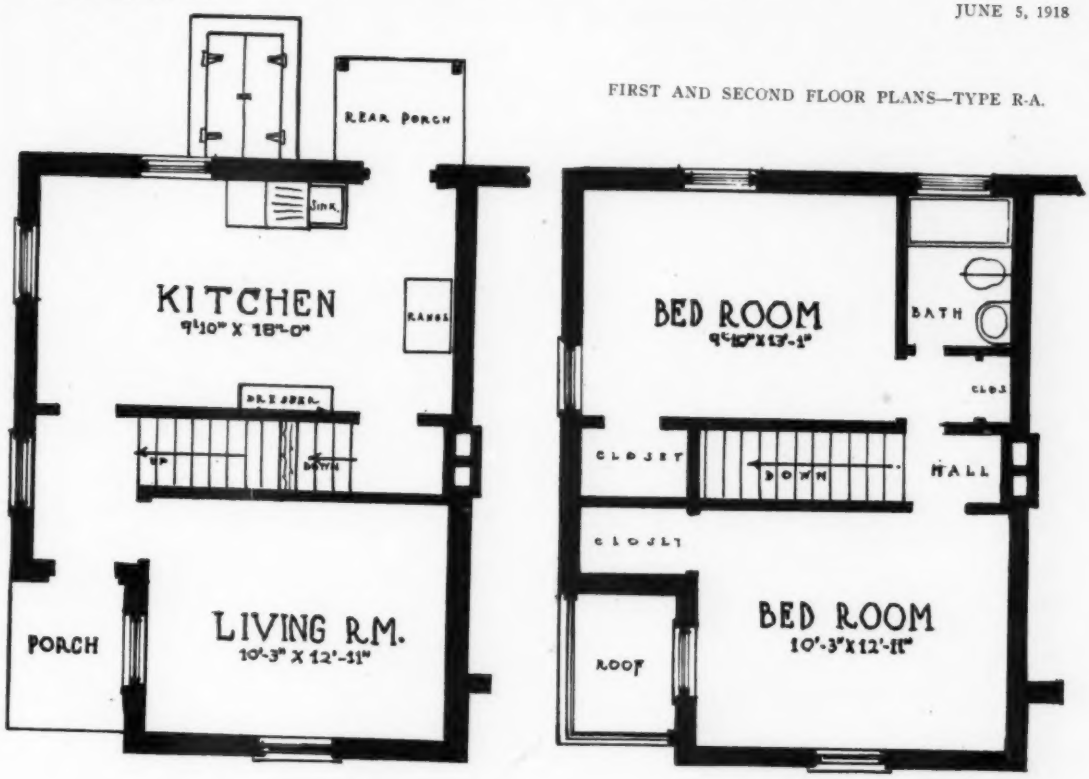
SECOND FLOOR—TYPE N.

HOUSING DEVELOPMENT FOR NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

ELECTUS D. LITCHFIELD, *ARCHITECT*

XUM

FIRST AND SECOND FLOOR PLANS—TYPE R-A.



FIRST AND SECOND FLOOR PLANS—TYPE Y-A.

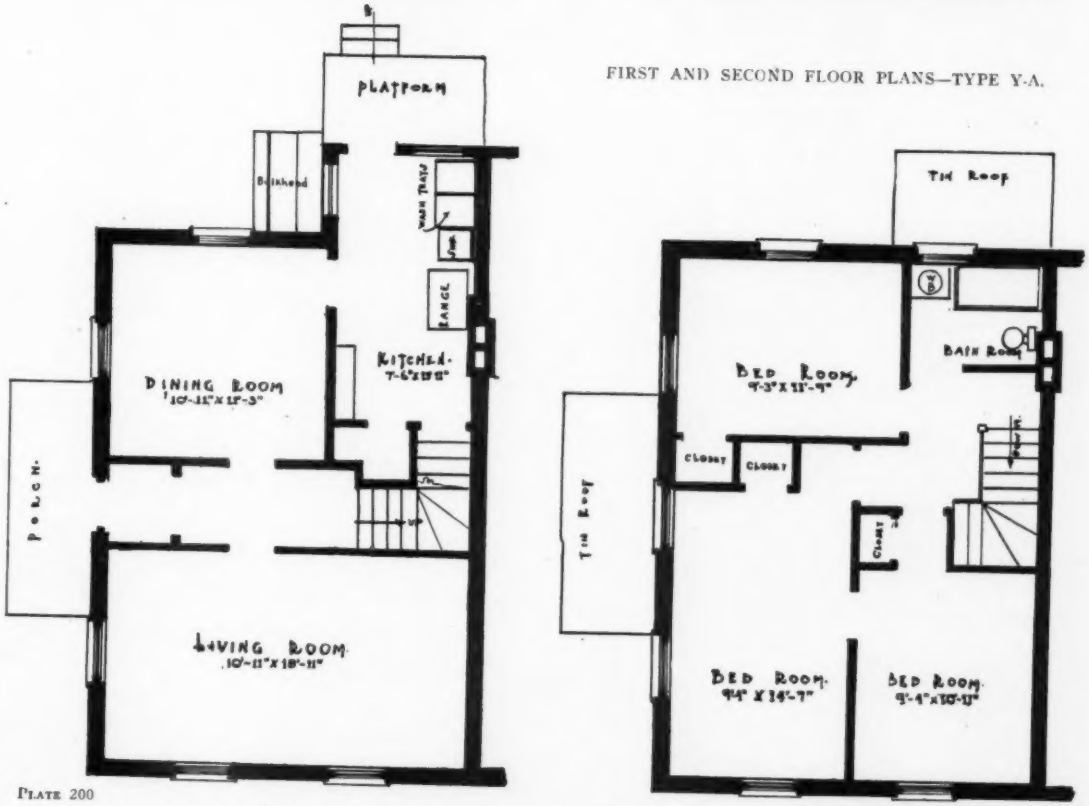


PLATE 200

HOUSING DEVELOPMENT FOR NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

ELECTUS D. LITCHFIELD, *ARCHITECT*

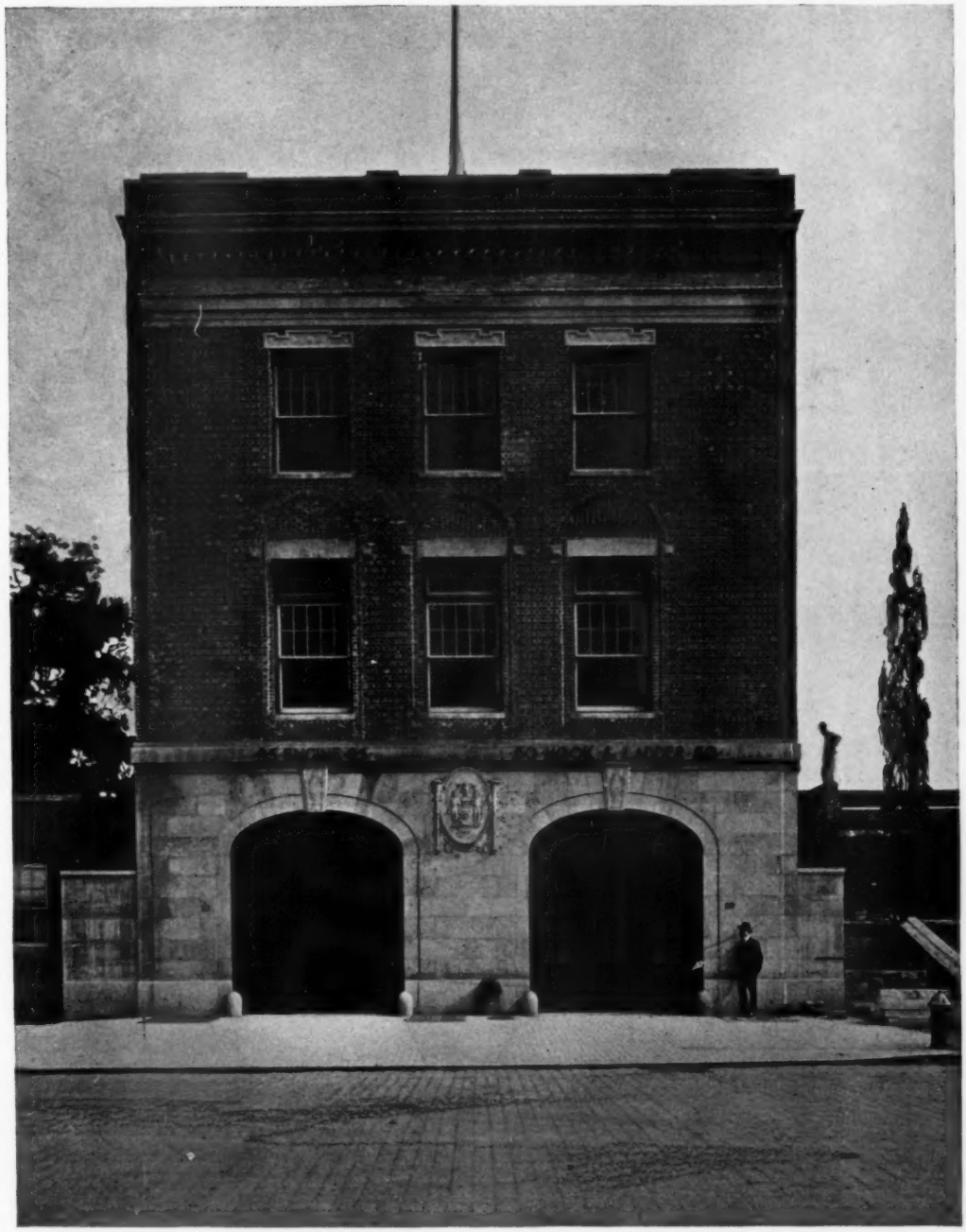
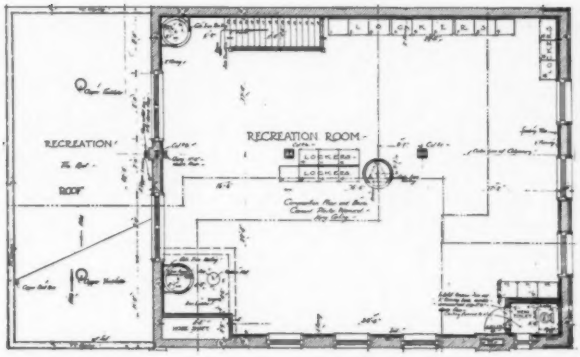


PLATE 201

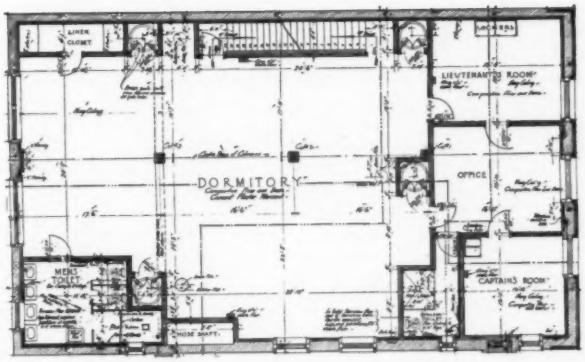
FIRE ENGINE HOUSE, VERMILYE AVE., NEW YORK

DENNISON, HIRONS & DARBYSHIRE, *ARCHITECTS*

THIRD FLOOR PLAN



SECOND FLOOR PLAN



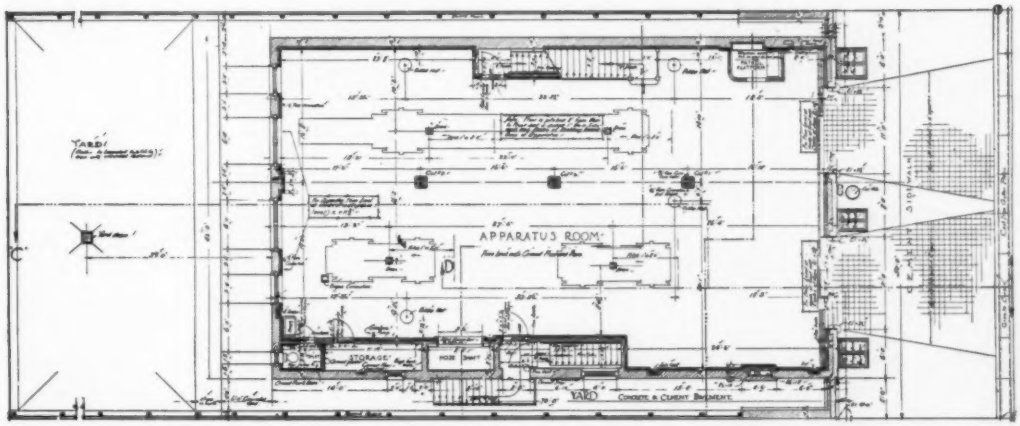


PLATE 202 FIRST FLOOR PLAN.

FIRE ENGINE HOUSE, VERMILYE AVE., NEW YORK

DENNISON, HIRONS & DARBYSHIRE, *ARCHITECTS*

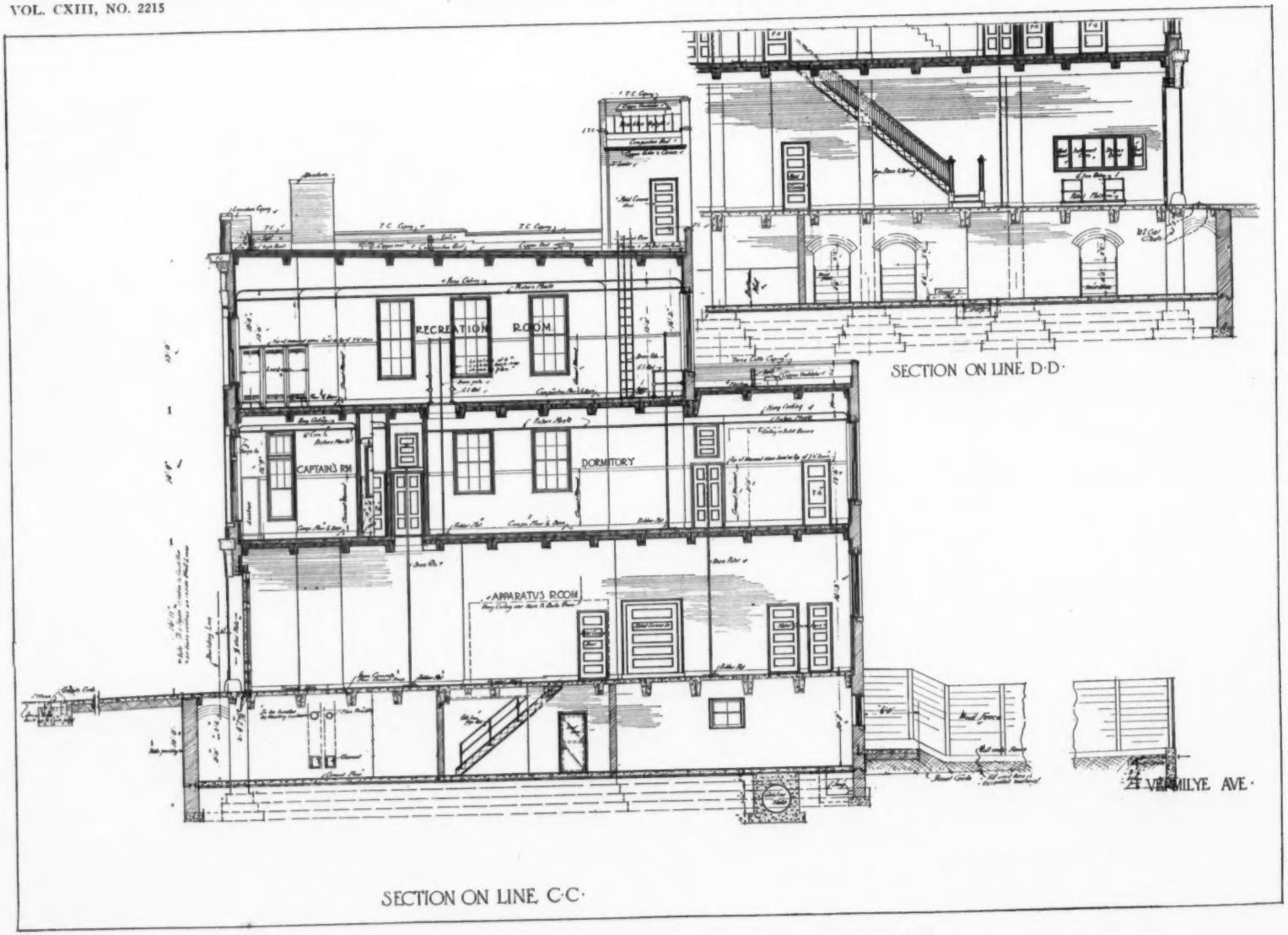
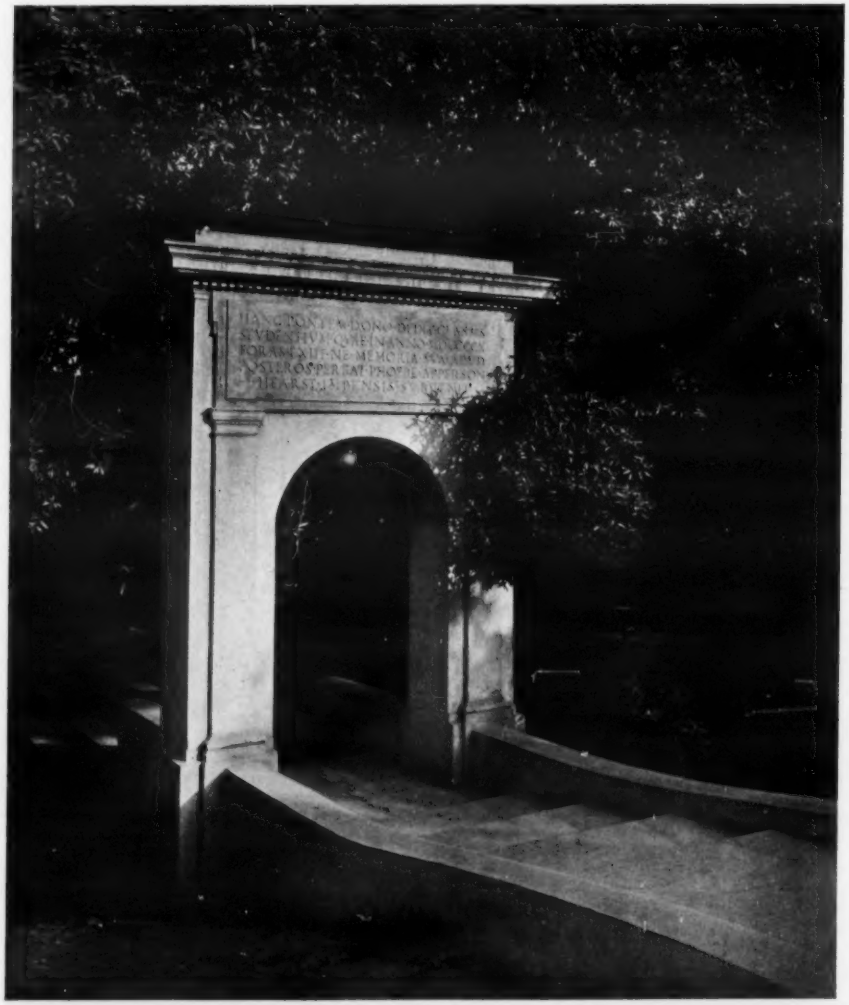


PLATE 203

FIRE ENGINE HOUSE, VERMILYE AVE., NEW YORK

DENNISON, HIRONS & DARBYSHIRE, *ARCHITECTS*



ABOVE:

GYMNASIUM, LELAND STANFORD, JR., UNIVERSITY

AT LEFT:

FOOTBRIDGE, UNIVERSITY OF CALIFORNIA

□ □

BAKEWELL & BROWN, *ARCHITECTS*

PLATE 204

PLATE 205

HOUSE OF GEORGE LENT, WOODSIDE, CAL.

BAKEWELL & BROWN, *ARCHITECTS*

Getting the Foreign Workman's Viewpoint

Being in Part an Address Delivered Before the American Institute of Mining Engineers in New York

By PRINCE LASAROVICH-HREBELIANOVICH

I WAS asked by the chairman of one of the Sessions on Employment Problems to talk about the viewpoint of the foreign workingman. I am not a workingman. I have never done what a work-hand might call an honest day's labor; that is, I have never been in a factory or manufacturing plant or in a mine, though in truth, hard work and I are well acquainted. I was a soldier, am an engineer, have long been actively interested in the most important waterway construction in the near East, have served politics and diplomacy, written books and lectured at universities. My knowledge of the foreign workingman in this country comes from the fact that my own compatriots here at various times came to me and appealed for advice and help, and last year I was asked by the employment manager of a corporation to undertake a welfare job at one of their plants. I went out, saw the plant, talked with the superintendent and outlined certain of my ideas which he, personally, heartily approved, but which did not find favor with those higher up.

I approach the subject of the foreign workman's point of view with the understanding that the industrial employer's effort is for the maximum of efficiency. I am conversant with labor conditions abroad both in industry and agriculture. What I have learned of industrial conditions in America as they affect the foreign immigrant has been gathered chiefly from the cases referred to of foreign workmen who from time to time have come to me with their troubles. In the course of those investigations, in order to give whatever help or advice was possible, I have been impressed with the fact that the great United States industries evidently had not yet sufficiently recognized the value of studying the conditions of the workingman in the lands of his origin across the seas. A careful study of that which could be called the moral element in connection with its foreign labor would give industry a knowledge of the man's reason for coming, what grievances he brings with him, his hopes for a future, and the peculiar character of his capacities. The employer would thereby be enabled to meet the man, to be helpful to him, to aid him and at the same time promote industrial efficiency, inasmuch as a workman who believes that he is being dealt with humanely and squarely is contented and satisfied and will give willingly, and even with pride, the best that is in him; justice and a fair deal is all the man wants.

The conditions of the foreign workman in his home land, and some others peculiar to his situation in this country from the moment of his landing, complicate the foreign-labor problem exceedingly and unnecessarily, contributing many factors of discontent among the laboring classes—factors not created by the industry itself, but from which industry becomes the chief sufferer. As an illustration of the recognized paramount value to a great organization, of thorough and exact knowledge of all moral elements in addition to the direct physical ones, consider for a moment the study and mastery which the German military machine applies to a wide range of conditions in its own home and in enemy lands and in all foreign lands affecting or that might affect German policy. The military usefulness of this vast knowledge might not at first sight be appreciated by persons unfamiliar with the vital service it renders in warfare. When the German General Staff studies the efficiency of an enemy army, or even the efficiency of its own forces, the so-called moral element plays an important part in that consideration. This moral element indicates what can be expected from troops, which are the particular fitnesses of a certain body of troops to perform certain particular tasks, and forms the basis of many infinitely valuable calculations. This so-called moral element, which has nothing to do with the training, the drilling of the army, etc., includes the national characteristics of the local recruitment origin of the troops, origin of the officers and of the men, social conditions, living conditions, religious conditions, political views, weakness in the social and economic fabric amenable to destructive agencies; morality in public and private life as reflected in the daily press, the light literature, the records of the courts of justice, statistics of mortgage, charities, etc. The short appreciation of the French army which General Boguslavski, of the German army, made in introducing his study of tactics in the Franco-German war (1870-71) is an instance of the extent to which that moral element is examined with the aim of making the German war machine efficient and irresistible.

So, the efficiency of industrial enterprises taken as enterprises alone, and of the industry of a country as a whole, in considering the labor problem, cannot afford to neglect the study of the moral element, which ought to include the thorough investigation of the conditions and environment of the

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foreign immigrant workman in his home lands. Incidentally, it may be said that in addition to the value of that knowledge to the mutual relations between the employer and the employed, other rich by-products of commercial achievement would certainly accrue therefrom to the industry.

The foreign workmen in the United States may be divided into two groups: I, of Northwest European origin; II, of East and South European origin. The first group consists of British, Scottish, mainly Irish—then Germans, French and Scandinavians. The second group consists of Lithuanians, Poles. Russians, Slavs from Austria-Hungary, from the Balkans (Macedonia), and of Italians and Greeks. These two groups are radically different in many respects. The men of group I previous to their immigration were on the whole industrial workers. or agricultural workers who lived from hand to mouth. They come to the United States with the clear intention to settle here, to make homes and improve their economic conditions. The men from group II are generally from agricultural districts. in most cases farmers, many of them owners of some land and a few head of cattle. These men come to this country single, without their families. lured by advertisements which depict the opportunities for earning in America in most vivid and unreal color. The men have been told stories of gold simply to be found on the streets. The man comes over to earn money to pay off mortgages on his farm, or on that of a brother or of a father. Bad agricultural conditions, bad harvests coupled with political and religious persecution, are the direct causes of emigration.

The Italians and Greeks are in a class separate by themselves. The Italian immigration comes from southern Italy, and they come less from agricultural districts, where they were only laborers, than from towns. The Greek from Greece is also generally a townsman, who believes in coming here to better his earnings. Thus, the man of group II generally comes with no intention to settle, and he sends all his earnings back to his home.

The living standards of group I are lower in their home lands than those of group II. Here the contrary takes place: the living standards of group I are far above those of group II, which in America are miserable. Group I spend their earnings toward founding new and better homes in America. Group II are here in America to earn a certain amount of money and then go back—hence they are willing to do harder work under worse conditions than those of group I. These circumstances lead to the first misunderstandings of those men by the employer. The employer assumes that the men of group II do not know better conditions and treats them accordingly. The treatment he is generally accorded from the moment he lands makes him distrustful and his experience involving questions of good will and fair play and justice are often most bitter.

The man of the first group, individualistic in his tendencies, comes from a part of Europe where the individualistic civilization resembles your own; coming to seek a new home, he quickly finds his place and it is natural for you not to draw any line between him and your own native-born workman. But the matter is different in regard to the Slav belonging to the second group. Co-operation, not individualism, is the basis of all his social organizations. He lives in groups, works in groups, thinks in groups, whether in agriculture, handicraft or industry. As a crude picture of his way of doing things: In Russia, a dozen men, coming from different directions, meet at cross roads, men who belong all to the same trade—say the carpenter trade—they do not know one another, they come from far separate villages, but coming together at the crossway, they make acquaintance, find they belong all to the same craft; they form a union, "artel," as you know it is called in Russia, and elect a head, the "artelshik." When they come to the next town the "artelshik" will seek work for the whole union. If only three are needed and the others cannot be employed in that place, three will take the jobs and the money earned by them will go toward the upkeep of the whole group. I take this as one of the most radical examples of the idea.

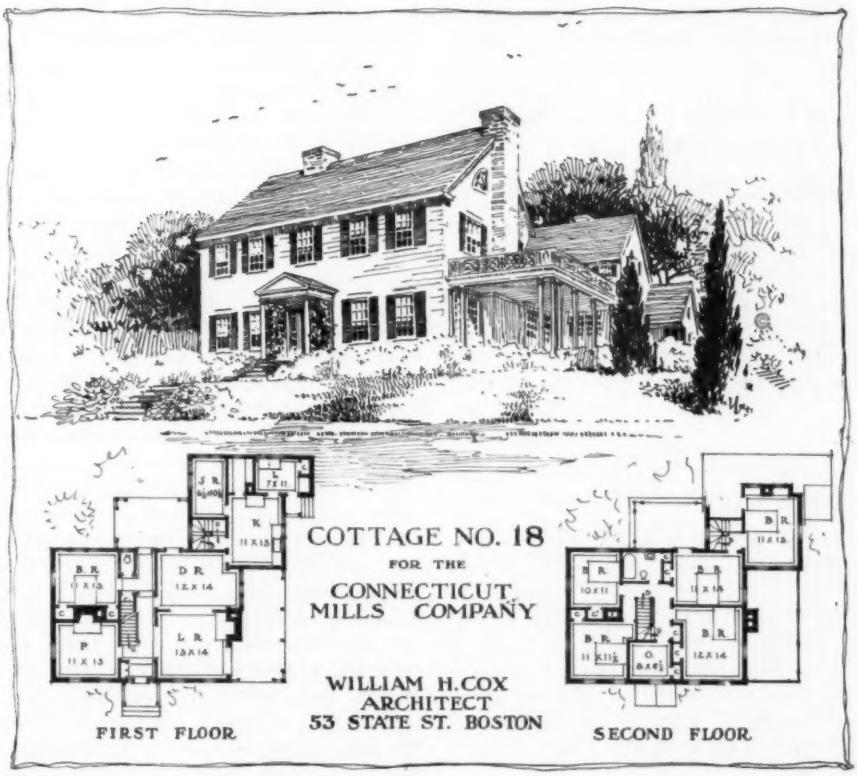
In my country—I am a Serb—before the war, I am proud to say we had no paupers. You can see in the Statesman's Year Book stated under the name of Serbia, "No pauperism, no charity institutions necessary, every man a freeholder." The man himself perhaps, the individual, does not own more than four or five acres, but it is worked in co-operation. Where in Russia you have the "Mir," that is the village community, as the co-operative unit, in my country we have the family or the working group as the co-operative unit; and you find co-operative units composed of 30 to 40 members, on 100 acres, who live very well, have meat the whole year around, are well clothed, and put several hundred dollars, perhaps a thousand dollars, aside every year as a reserve fund, besides paying taxes and providing for improvements for the next year. Even where the co-operative group meets with poorer success and bad luck, it still produces a free man used to home comforts and some idea of personal ambition. This is at the root of one of the difficulties which the foreign workman of that type meets in this country. You look at him as an inferior being; abroad, in his home, his living standards are as good as those to which you are accustomed. He lives perhaps better in his own country

than does the working man who belongs to the first group, and comes from Ireland, for instance. He comes here with the idea of earning money to improve conditions at home. You approach the man; you want to help him, but you think the miserable conditions in which you see him living here are those suited to him. If he ever had an idea of settling here, that idea is often taken away from him during his first few days in the country. If you knew what the workingman from our countries, from what I call the second group, has often to pass through from the moment he lands here, and with what faith he comes to these shores, you would realize his disappointment and the misery of his situation.

At Ellis Island the man does not find representatives holding out friendly arms to welcome a new son of freedom, but instead many bewildering conditions, among which are agents of several kinds lying in wait for him. When you come to him at this moment with Americanization ideas, you come to a man weary and sore. You do not understand what is the matter and you don't know how to grip him. From that time he distrusts you, which drives him often into the hands of political tricksters and other propagandists who are no more his friends than they are yours. When he gets on a little, finds fellow countrymen, he forms a household group with them and sometimes creates possible living conditions for himself, entering perhaps some workers' mutual organization. We have quite a number of these in America and they are of the greatest value to the workman, wherever they are run as they ought to be. But when they chance to fall into wrong hands they can become the means of cruel exploitation of their members and organs of other mischief.

It is a habit to accuse the foreign worker as a man of subversive tendencies, etc. Nine times out of ten he is not, and nine times out of ten he is the innocent and suffering victim of smug and clever and powerful gentlemen who use him and his troubles in their political machinations.

The foreign workman should be studied in the lands of his origin from the human point of view, and more searching measures taken here from the moment he lands to make him know the good side of America; which, in truth, somewhere does exist as he pictured it, but where that fair dream never "comes true" for him.



"White Coal"

An original term, descriptive of the country's bountiful supply of water power for the production of electric and motive power, is "white coal." As a cheap and effective medium for the generation of heat, light and power, the unharnessed waterways of the country offer the greatest possibilities. When this power has been successfully controlled, the annual saving of coal will amount to millions of tons in addition to the annual saving in its transportation and handling.

Washington Arch Completed

When in 1894 the Washington arch which stands at the foot of Fifth Avenue in Washington Square, New York City, was built, after designs by the late Stanford White, the sculptured adornment was, owing to lack of funds, omitted. This lack has now been overcome by the recent placing of a second group of statues on the north side of the arch. This group is double life size and was executed by A. Stirling Calder. It represents Washington in full relief with the allegorical figures of Wisdom and Justice in bas relief in the background. As now completed, this arch represents one of the most valuable art possessions in the city of New York.

New York Society of Architects Elects Officers

At the twelfth annual convention of the New York Society of Architects held recently at the Engineers Building, New York City, the following officers were elected:

President, James Riely Gordon; vice-president, Adam E. Fischer; second vice-president, Edward W. Loth; treasurer, Henry Holder, Jr.; secretary, Frederick C. Zabel; financial secretary, Edward Wehrlin.

Examination for Commissions in U. S. Engineers' Corps

An examination will be held July 8-12 at army posts throughout the country of candidates for commissions in the corp of engineers, regular army. The examinations are open to unmarried citizens of the United States, at least twenty-one years old and less than twenty-nine years old. Candidates must be graduates of engineering courses in approved technical schools. Further information may be obtained from the office of the Chief of Engineers, Washington, D. C.

Government Control of Inland Waterways

Director General McAdoo has ordered that the Erie and New York State Barge Canal system be taken over by the railroad administration and that a fleet of barges be constructed immediately and operated there under the direction of G. A. Tomlinson of Duluth, Minn., to relieve freight traffic.

This is the first inland waterway whose operation under the railroad administration has been finally decided upon as a result of the extensive investigation made by the committee on inland waterways of the railroad administration. Within a few weeks, however, the director general is expected to order the railroad commission to take over several other canal systems and navigable rivers, including the Chesapeake and the Ohio Canal, the Black Warrior River in Alabama, and several Atlantic Coast waterways to relieve traffic on the rail lines.

Government Workers at Washington Have Community Center

A community center for government employees has been opened in Washington, D. C., where it is expected every week from 20,000 to 30,000 government workers will be able to take advantage of the facilities for rest and recreation. The center is housed in the central high school.

Secretary of War Baker made the request that the large extra civilian population which the war has brought to the capital should be taken care of in community centers. As a result of this request and as an outcome of the work started in 1914 by Miss Margaret Wilson, daughter of the President, and carried on by Miss Cecil Norton, co-operation has been established between this work and the other organizations doing service along similar lines.

Central high school, recently completed at a cost of $1,500,000, is said to be the best equipped in the country. Its two gymnasiums, large swimming pool, outdoor and indoor running tracks, and drill hall, which can be used for dancing and tennis courts, will be at the disposal of the various clubs formed by the civilians and soldiers welcomed here by the community center workers. The building will be used largely for athletics by persons working all day at desks. Once or twice a month it is planned to hold patriotic meetings, when members of the clubs will be addressed by men and women who have returned from France. Small dues will be charged, since most of the expenses will be met by the $10,000 appropriated by Congress.

Holland's Building Plan

A Nationally Controlled Organization to Control Materials

The United States Consul at Amsterdam, Holland, reports that the great scarcity of building materials in Holland has led the Government to take action toward organized effort to ameliorate conditions as far as possible.

A company will be formed, it is stated, to purchase all building materials for the common benefit. More particularly will this purchase apply for materials for use in dwellings of which there is now a scarcity in Holland.

This company will also sell materials, furnish, or otherwise prepare them, and, in fact, act in every way to conserve the public interests and benefit in every way regarding building materials.

The company will have the active assistance by representation or otherwise of the Government.

The work of this company will be continued during the existence of abnormal conditions.

Danger in Standardization

There are certain factors involved in the question of standardization which are often ignored in its consideration. The serious contingencies possible, due to lack of proper forethought, are very real. For example, in estimating the saving to be effected by standardizing structures and machines, the estimator may easily forget that the time lost in effecting the standardization may far outweigh in value the saving therein. Another element of importance in such an economic problem lies in the retardation of improvement as a consequence of standardization.

Alba B. Johnson, president of the Baldwin Locomotive Works, in a paper read at the recent meeting of the Chamber of Commerce of the United States, develops the latter point, as follows:

If, however, it should be urged that the advantages of standardization to which the railroads can work would in the long run be sufficient to compensate for the disadvantages of present increased confusion, then some principle must be discovered by which standardization shall avoid the cessation, if not the extinction of improvements. Every improvement in some sense involves the destruction of standardization. It would be an evil day for American engineering and for American progress in the art of transportation which would involve a policy of discouragement to new and useful improvements in the art. We should therefore look carefully before we leap, to make sure that we are not giving up the substance of continued growth in efficiency and economy to grasp the chimera of standardization. Especially should this be considered most carefully when the world-wide danger of this war is upon us.

A Dakota Court Ruling on Architectural Practice

Professional architects can continue to practise as unlicensed architects in the State of North Dakota without conflicting with the architects' license law enacted at the last session of the Legislature, according to a decision made by the State Supreme Court May 11 in the case of W. D. Gillespie versus the State of North Dakota.

Mr. Gillespie, a prominent Fargo architect, was arrested for practising his profession without a State license. He demurred to the information, which was sustained by Judge A. T. Cole, of Fargo, and now the Supreme Court affirms the opinion of Judge Cole.

In rendering its opinion the court says:

"Chapter 58, Session Laws of 1917, which provides for the registration of licensed architects, does not abridge the right of a professional architect to continue to practise his profession as an unlicensed architect."

The court in ruling on the Gillespie case did not pass on the constitutionality of the license law, taking the position that its constitutionality was not involved in the case before them. The court merely held that it was optional with the architect to take out a license and that if he saw fit not to do so he could continue his practice as an unlicensed architect.

New Centers of Beauty

In an address made by President Hadley of Yale University when he accepted the new memorial quadrangle at Yale, much stress was laid on the necessity for well designed beautiful buildings, especially in this country, where our cities have been free from the scourge of war. The following extract from his address is a well presented plea for the consideration of civic art:

"A monumental building gives a visible and permanent object around which life and loyalty can grow and to which tradition and sentiment can attach. The man who looks out day after day into the college quadrangle of Oxford or Cambridge finds a stimulus both to his love of beauty and his love of learning. Such influence is more needed to-day than ever before. The waste of war is destroying churches and castles and glorious monuments of antiquity. Unless the world builds new centers of beauty and affection to take the place of the old, the twentieth century will, in spite of material progress, be essentially poorer than the nineteenth. And war has done more than lay buildings

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waste. It has, for the moment at any rate, distorted our standards. It has compelled us to look too much for immediate efficiency rather than permanent utility; to seek tangible effects and disregard intangible ones; to work for achievements of the moment rather than for those of the ages. Doubly important, then, is it to renew our supply of tradition and inspiration by buildings like this; to bring home to the students who shall live within these walls the lessons of affection and loyalty and love of the beautiful which should go into the life of an ancient college."

Wood Block Floors

The results of an investigation in materials for floors and flooring made by the National Safety Council with a view of determining the relative merits from a safety engineering point of view of various materials has just been published by the council in a "Bulletin of Safe Practices."

This publication declares that wooden block floors are especially satisfactory, particularly for heavy service. The investigation, which was carried on with especial reference to factories and warehouses revealed the following interesting fact, the bulletin says: "Under heavy traffic the ends of the wood fibre iron out and form a surface that grows stronger with use. It does not crack or corrugate, does not become slippery and is comparatively noiseless."

Great Plant Purchased for Aircraft Work

The Wright-Martin Aircraft Corporation completed negotiations recently for the purchase of the plant of the General Vehicle Company, occupying the entire block bounded by Borden, Star and Review Avenues, and Beaver and Fox Streets, in Long Island City, New York. The reported consideration was $1,000,000. The property was acquired for the purpose of speeding up work in connection with the aviation service of the Government, the buying corporation now having contracts calling for the delivery at the earliest possible time of 3000 airplane motors.

The plant is of the most modern type, the chief unit being a six-story structure measuring 200 by 600 feet. A smaller unit is two stories in height and measures 120 by 300 feet. There are in addition three other buildings, all directly connected by rail with the Long Island and Pennsylvania Railroads. Orders have been placed for additional equipment to cost approximately $1,500,000 and after the installation of the machinery, within three weeks, the plant will be operated at maximum capacity. It is estimated that about 8000 men would be employed there.

Government Seeking Location of All Available Black Walnut Trees

The needs of the Government for black walnut lumber for use in the manufacture of airplane propellers and gun stocks has become very urgent and the accumulation of the largest possible stock of the utmost importance. Black walnut timber is no longer to be found in abundance anywhere, but has to be culled from the pasture lots and other unusual locations where it has escaped the ax of the woodman.

Of the comparatively small amount there is yet left, some is found in the farmers' wood lots and similar unusual places for the cutting of timber. A novel scheme has been inaugurated in that the Boy Scouts of America have been called and have been requested to note carefully the location of all black walnut trees and to advise the Forest Service of the United States Department of Agriculture where they are to be found. It is to serve the wishes of the Government that this notice is printed, and to urge that any of our readers who may be able to assist in this matter will notify the Government.

Maitland Armstrong Dead

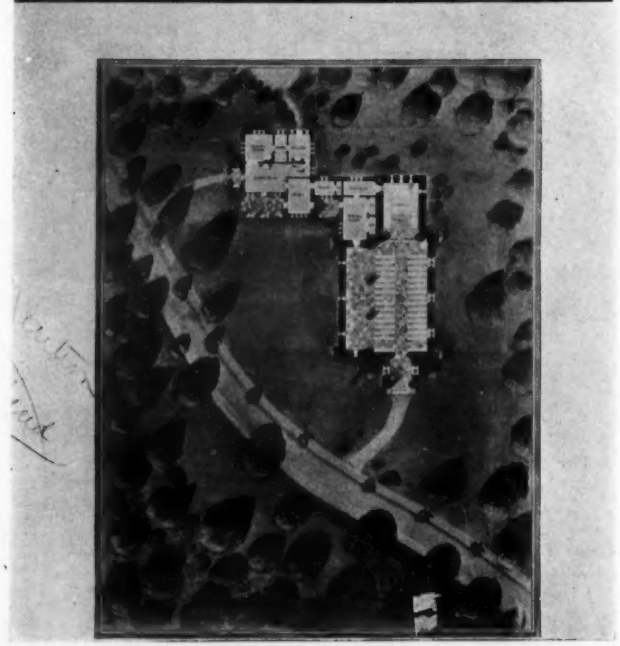
Maitland Armstrong, among the best known of the older generation of American artists, died at his home in New York on May 26 in his eighty-third year.

Mr. Armstrong was among the pioneers in stained glass work in the United States, and many notable windows designed and executed by him remain a record of his efficiency and artistic skill.

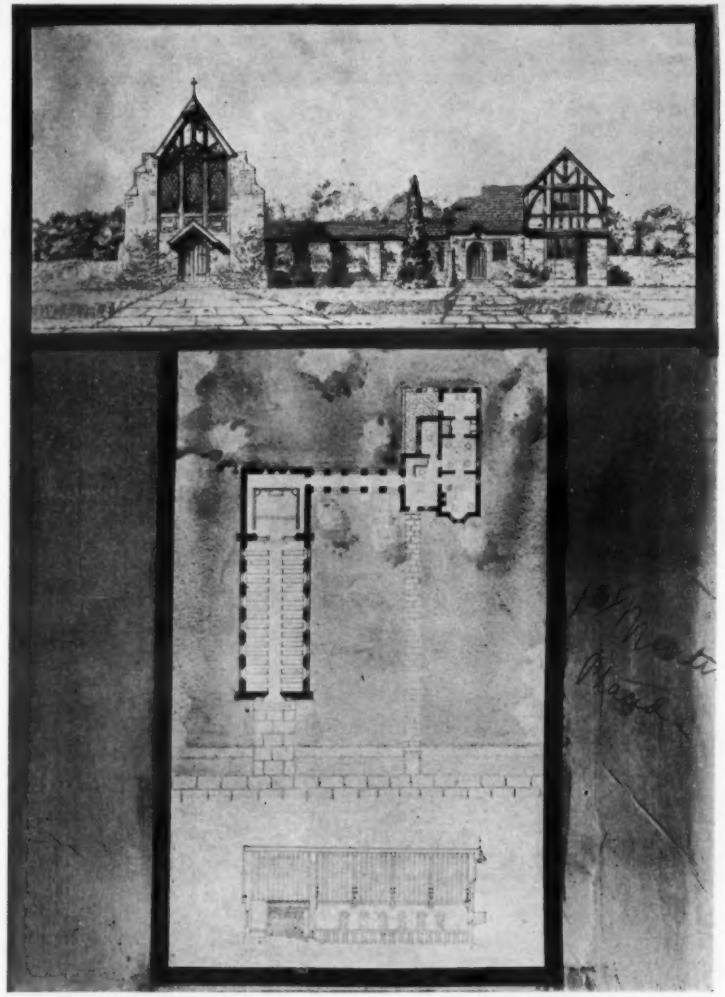
Personals

Benjamin W. Trunk, senior member of the architectural firm of Trunk & Gordon, St. Joseph, Mo., died at the age of forty-five. He designed the State Capitol at Little Rock, Ark., and many schools and prominent buildings in Iowa and Missouri.

Robert Helmer, architect, whose offices were 286 Fifth Avenue, New York, has been appointed to a position with the United States Shipping Board, Emergency Fleet Corporation. Mr. Helmer has closed his office for the duration of the war.



R. S. McCAULEY—FIRST MENTION PLACED, ATELIER WYNKOOP



R. FINKELHOR—FIRST MENTION PLACED, CARNEGIE INSTITUTE

CLASS B. V. PROJET—A COUNTRY CHAPEL

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

Beaux-Arts Institute of Design

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

DIRECTORS OF DEPARTMENTS

ARCHITECTURE, FREDERICK A. GODLEY — SCULPTURE, LLOYD WARREN

MURAL PAINTING, ARTHUR CRISP

Official Notification of Awards—Judgment of May 21st, 1918

PROGRAM

CLASS "B"—V ANALYTIQUE

The Committee on Architecture proposes as subject for this Competition:

"A PROBLEM IN SUPER-POSED ORDERS"

It is proposed that the public building, which is the subject of this problem, should have, as the motif of its façade, super-posed columns of the Doric and Ionic orders. These columns should be treated either as engaged to the wall of the building or as slightly free-standing, but not as a portico. The building shall contain two stories, the heights of which are to be determined by the competitor. The only dimension given is the height of the lower column which, including the cap and the base, must not exceed 25'-0".

JURY OF AWARD: R. M. Hood, L. Warren, H. Hornbostel, J. A. Gurd and A. L. Noel.

Number of Drawings Submitted: 50.

AWARDS

FIRST MENTION PLACED: R. W. Schmertz and W. J. Erdner, Carnegie Institute of Technology, Pittsburgh; T. F. Price, Atelier Wynkoop, New York.

FIRST MENTION: L. S. Lashmit, Carnegie Institute of Technology, Pittsburgh; H. W. Landman, Atelier Fowler, Baltimore; A. Gambell, Portland Architectural Club, Portland, Ore.; E. R. DeShaw and M. V. Dittmar, Syracuse University, Syracuse; W. A. Streng and W. S. Chinn, University of Washington, Seattle; W. M. Icenhower, University of Kansas, Lawrence.

MENTION: H. T. Bell, Beaux-Arts Atelier, Washington, D. C.; W. H. Nash and R. F. Rabold, Catholic University, Washington, D. C.; H. Anderson, Columbia University, New York; W. J. Perkins, Carnegie Institute of Technology, Pittsburgh; C. J. Ebert, Atelier Fowler, Baltimore; J. Lucchesi, Atelier Hirons, New York; A. R. Nelson, E. Babitsky and L. Keister, Jr., J. Huntington Polytechnic Institute, Cleveland; S. Oxhandler, 1013 Bryant Avenue, New York; W. Ullrich, J. L. Dymock, L. C. Neilson, L. J. Thompson, R. D. Howell and R. M. Perry, Pratt Institute, Brooklyn, N. Y.; M. Sillani, Atelier Rebori, Chicago; W. R. Shirley, J. W. Ayars, G. H. Spohn, C. Grieb, Ruth Doman, J. A. Fernandez and B. M. Dawson, Syracuse University, Syracuse; C. S. Thalheimer, "T" Square Club, Philadelphia; L. J. Ellis, H. E. Johnston, H. G. Foulkes and I. G. Smith, University of Oregon, Eugene; C. V. Rueger, University of Washington, Seattle; L. Soxman, J. L. Benson and H. O. Beisner, University of Kansas, Lawrence.

PROGRAM

CLASS "B"—V PROJET

The Committee on Architecture proposes as subject for this Competition:

"A COUNTRY CHAPEL"

Upon a piece of land approximately level it is proposed to erect a country chapel which will accommodate a congregation of 200 people. It should contain, besides the auditorium and chancel, a small robing room, while near the chapel, and connected with it by a covered passage should be a small house for the minister or rector. This house should contain on the ground floor, a vestibule, living room, study, dining room, pantry and kitchen; while on the second floor are bed rooms and bath.

JURY OF AWARD: F. A. Godley, H. W. Corbett, H. R. Sedgwick, H. M. Woolsey, D. J. Baum, F. C. Hirons and H. Sternfeld.

Number of Drawings Submitted: 33.

AWARDS

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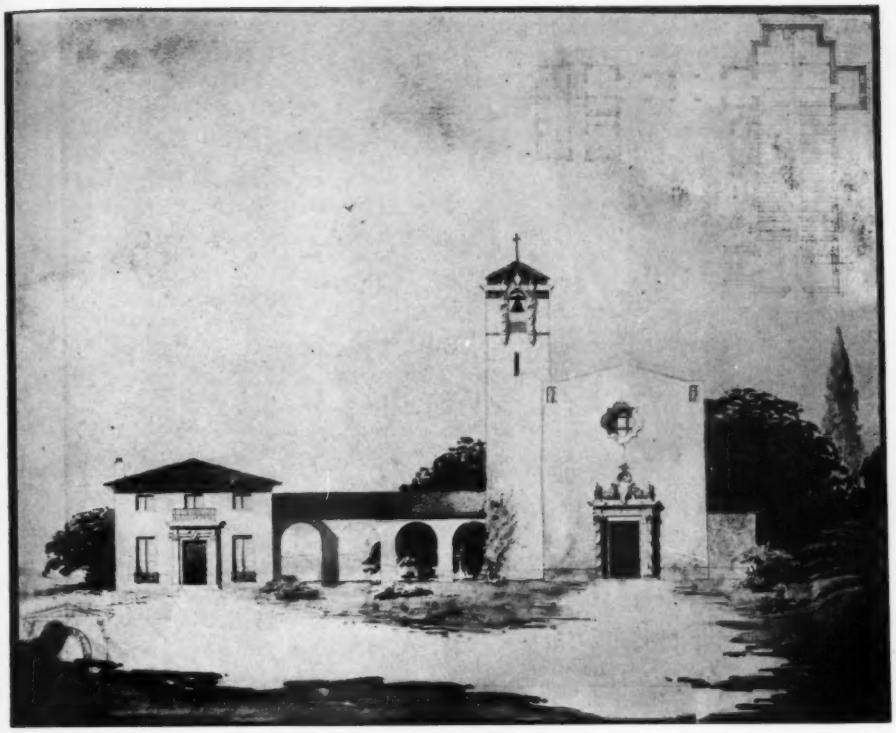


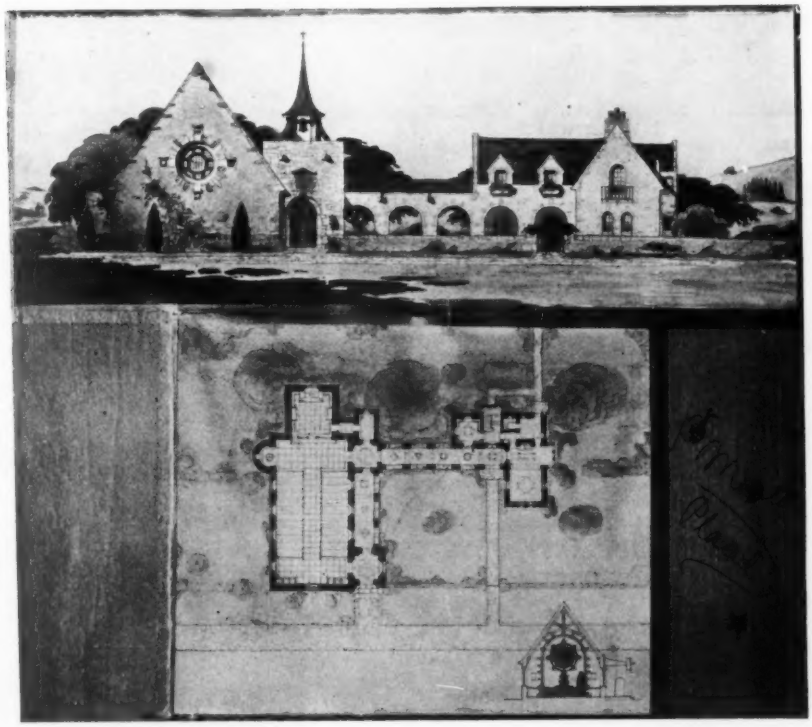
CLASS "B"
V PROJET

□ □

A COUNTRY CHAPEL

□ □

J. W. HERSHEY—FIRST MENTION PLACED, JOHN HUNTINGTON POLYTECHNIC INSTITUTE



G. N. PAULY
FIRST MENTION PLACED, CARNEGIE INSTITUTE OF TECHNOLOGY

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STUDENT WORK
BEAUX-ARTS INSTITUTE OF DESIGN

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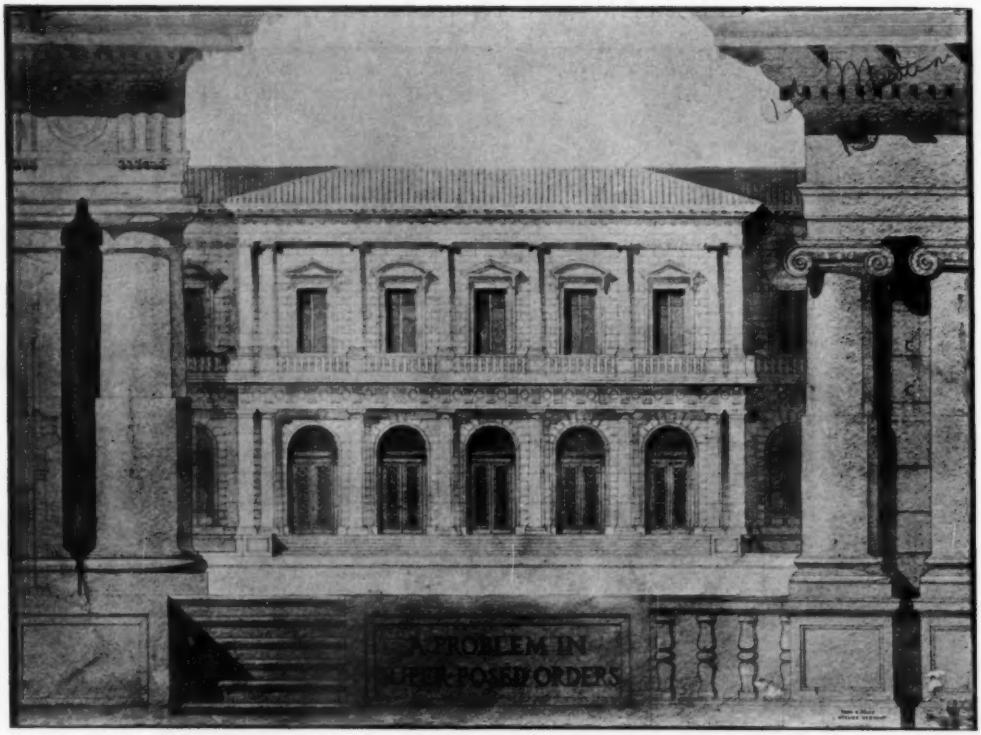

ABOVE: T. F. PRICE—FIRST MENTION PLACED, ATELIER WYNKOOP

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CLASS "B"—V ANALYTIQUE

A Problem in Super-posed Orders

□ □

STUDENT WORK
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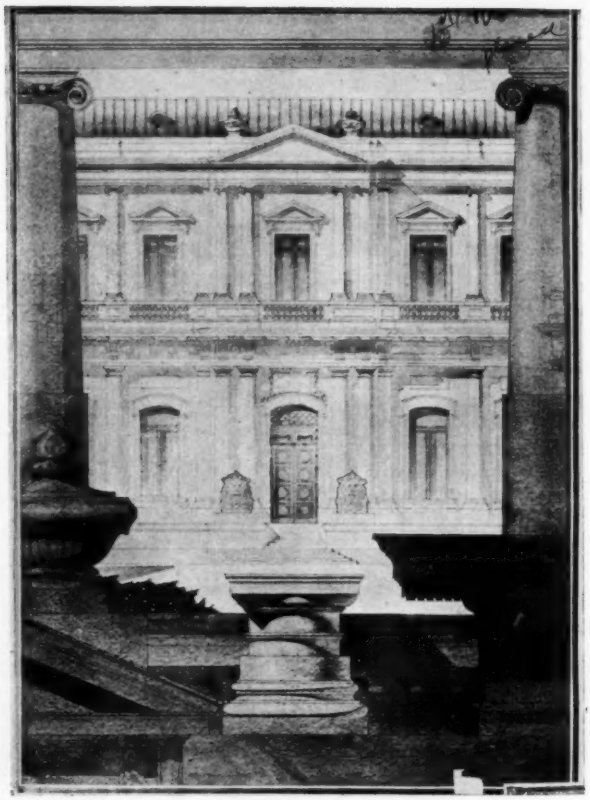

Department of Architectural Engineering

Heat Transmission Through Various Types of Sash

In Two Parts—Part II

THE heat-transmission rates in terms of B.t.u. transmitted per 24 hours per degree Fahr. per square foot of opening (H in formula [1]), are given in Tables 1 and 2. Table 1 is based on a heat head of 40 degrees Fahr. and Table 2 on a heat head of 70 degrees Fahr. From these data the curves shown are plotted. It will be noted that the rate of transmission increases with the heat head and that there is a greater increase, or steeper curve for single than for the double-glazed sash.

TABLE 1—HEAT-TRANSMISSION RATES AT APPROXIMATELY 40 DEG. FAHR. TEMPERATURE DIFFERENCE

Sample	Actual Heat Head, Deg. Fahr.	H Computed at Actual Heat Head	H Corrected to 40 Deg. Fahr. Heat Head	Relative Humidity	Condensation
No. 1 Single-glazed solid steel	44.5	29.3	28.5	36	None
No. 2 Double-glazed solid steel—$\frac{3}{4}$-in. air space	37.4	20.4	20.5	34	None
No. 3 Double-glazed solid steel—$\frac{7}{8}$-in. air space	45.7	22.8	22.5	43	Very slight on air-space side of one outside pane and box side of one inside pane.
No. 4 Double-glazed wood—$\frac{3}{4}$-in. air space	47.3	14.2	13.9	49	None
No. 5 Single-glazed wood	41.2	25.6	25.5	44	Hardly noticeable
No. 6 Double-glazed hollow metal—$\frac{3}{4}$-in. air space	43.9	15.4	15.2	54	On air-space side of one outside pane.
No. 7 Single-glazed hollow metal	46.0	27.1	26.4	43	All

In order to determine the paths of heat-transmission more definitely, temperatures of the glass and sash bars were taken during each test. This was accomplished by inserting a thermometer in a chamber in a 2-inch cork board, which was fitted tightly against the surfaces whose temperature was to be tested. The temperatures thus obtained must have been several degrees lower than actual but it is believed that the comparative temperatures were fairly well measured. These tests showed that the steel sash bars were hotter than the wooden bars, for a given temperature difference between the temperature of the inside of the box and that of the surrounding air. The hollow metal sash bars were cooler than the solid steel bars but warmer than the wood bars.

TABLE 2—HEAT-TRANSMISSION RATES AT APPROXIMATELY 70 DEG. FAHR. TEMPERATURE DIFFERENCE

Sample	Actual Heat Head, Deg. Fahr.	H Computed at Actual Heat Head	H Corrected to 70 Deg. Fahr. Heat Head	Relative Humidity	Condensation
No. 1 Single-glazed solid steel	73.9	34.2	33.6	28	All
No. 2 Double-glazed solid steel—$\frac{3}{4}$-in. air space	76.8	21.8	21.6	20	15 outer panes out of 20 showed moisture on air-space side
No. 3 Double-glazed solid steel—$\frac{7}{8}$-in. air space	76.0	24.2	24.0	30	One outer pane showed moisture on air-space side; one inner pane showed moisture on box side. Three lights showed both the above
No. 4[1] Double-glazed wood—$\frac{3}{4}$-in. air space	79.8	15.5	15.1	31	None
No. 5 Single-glazed wood	67.6	28.9	29.3	29	12 lights
No. 6 Double-glazed hollow metal—$\frac{3}{4}$-in. air space	75.6	16.6	16.4	36	On air-space side of one outside pane
No. 7 Single-glazed hollow metal	77.7	30.5	29.7	25	All

[1] A test upon this same wood sash with the inside panes of single-thick plain glass instead of double-thick, showed an increase in H of 3 per cent at 70 deg. fahr. temperatu e difference.

Indirectly, a further heat loss through the glass

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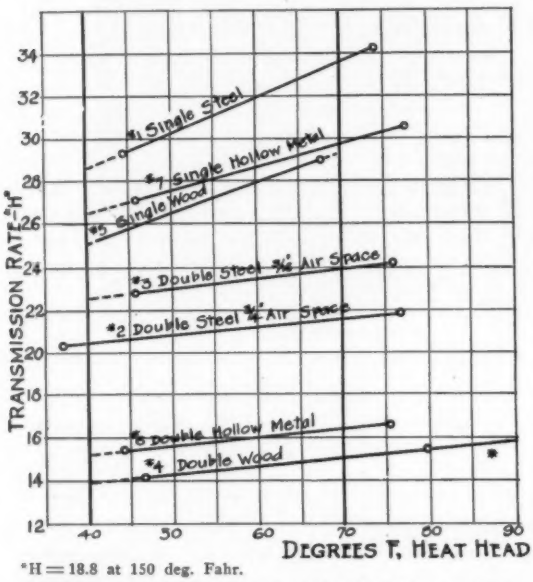
itself, in the case of double-glazed steel sash, can be laid to the solid steel section. Since the amount of heat lost through a given pane of glass depends directly upon the difference in temperature between the two sides, it is evident that in a *double-glazed sash* the rate of heat transmission through the lights must increase with the temperature difference between the air space and the outside air. Tests showed that the temperature difference between the air in the ¾-inch air space of the steel sash and the outside air was at least 20 per cent higher than the corresponding temperature difference in a wood sash, evidently due to the effect on the enclosed air of the warmer steel sash bars.



*H = 18.8 at 150 deg. Fahr.

DIAGRAM OF HEAT TRANSMISSION RATES

To illustrate the practical application of these tests a typical case is presented. In the design of two reinforced concrete buildings there arose the question whether to use single- or double-glazed steel sash. The following data based on prices in 1915-16 applied to the problem:

Wall openings to be glazed	37,800 sq. ft.
Average inside temperature, heating season	70 deg. fahr.
Average outside temperature, heating season	35 deg. fahr.
Average temperature difference (70−35 deg. fahr. =)	35 deg. fahr.
Heat delivered from steam plant per pound of coal	8500 B.t.u.
Length of heating season	4850 hr.
Cost of coal per 2000 lb.	$4.00
Assumed cost of hot-water-heating system per square foot of heating surface, including heater, based on −10 deg. fahr. outside temperature	$0.60

Proposition A, single-glazed steel sash. From the test, *H* at 35 deg. fahr. = 27.7 B.t.u. per degree difference in temperature per square foot per 24 hours.

Comparative yearly coal bill[1]	$1,750.00	
Comparative initial investment cost of sash erected		$15,600.00
Cost of heating system to supply window loss only, based on 18,400 sq. ft. at $0.60		11,040.00
Total investment		$26,640.00

Proposition B, double-glazed steel sash, $\frac{3}{16}$-in. air space. From the test, *H* at 35 deg. fahr. = 22.3 B.t.u. per degree difference in temperature per square foot per 24 hours.

Comparative yearly coal bill	$1,410.00	
Comparative initial investment cost of sash erected		21,000.00
Cost of heating system to supply window loss only, based on 12,800 sq. ft. at $0.60		7,680.00
Total investment		$28,680.00

Proposition C, double-glazed steel sash, $\frac{3}{4}$-in. air space. From the test, *H* at 35 deg. fahr. = 20 B.t.u. per degree difference in temperature per square foot per 24 hours.

Comparative yearly coal bill	$1,260.00	
Comparative initial investment cost of sash erected		$25,750.00
Cost of heating system to supply window loss only, based on 11,500 sq. ft. at $0.60		6,900.00
Total investment		$32,650.00

[1] $\frac{\$4.00 \times 37{,}000 \text{ sq. ft.} \times 27.7 \text{ B t u} \times 4850 \text{ hr.} \times 35 \text{ deg. Fahr.}}{2000 \text{ lb.} \times 24 \text{ hrs.} \times 8500 \text{ B t u (useful coal values)}} = \$1750.00$

TABLE 3—SUMMARY OF RESULTS

	Yearly Coal Bill	Initial Expenditures		
		Sash	Heating System	Total
Proposition *A*	$1750.00	$15,600.00	$11,040.00	$26,640.00
Proposition *B*	1410.00	21,000.00	7,680.00	28,680.00
Proposition *C*	1260.00	25,750.00	6,900.00	32,650.00

It is evident that an investment of $2,040 for B over that for A would result in an annual saving of $340 worth of coal, or 17 per cent gross on the additional investment. Also, an additional investment of $6,010 for C, over that of A would result in an annual saving of $490 worth of coal, or only 8 per cent gross on the additional investment, which eliminates proposition C. The choice in this case would be between A and B.

The same propositions, based on prices current in April, 1918, work out as follows:

Proposition A, single-glazed steel sash.

Comparative yearly coal bill*	$4,375.00	
Comparative initial investment cost of sash erected		$22,680.00
Cost of heating system to supply window loss only, based on 18,400 sq. ft. at $1.20		22,080.00
Total investment		$44,760.00

Proposition B, double-glazed steel sash, $\frac{3}{16}$-in. air space.

Comparative yearly coal bill*	$3,525.00	
Comparative initial investment cost of sash erected		$30,240.00
Cost of heating system to supply window loss only, based on 12,800 sq. ft. at $1.20		15,360.00
Total investment		$45,600.00

Proposition C, double-glazed steel sash, $\frac{3}{4}$-in. air space.

Comparative yearly coal bill*	$3,150.00	
Comparative initial investment cost of sash erected		$37,800.00
Cost of heating system to supply window loss only, based on 11,500 sq. ft. at $1.20		13,800.00
Total investment		$51,600.00

*Cost of coal per 2000 pounds at $10.00.

TABLE 4—SUMMARY OF RESULTS

	Yearly Coal Bill	Initial Expenditures		
		Sash	Heating System	Total
Proposition *A*	$4375.00	$22,680.00	$22,080.00	$44,760.00
Proposition *B*	3525.00	30,240.00	15,360.00	45,600.00
Proposition *C*	3150.00	37,800.00	13,800.00	51,600.00

In this case, an investment of $840 for B over that of A results in an annual saving of $850 worth of coal, or 100 per cent gross on the additional investment. And an investment of $6,840 for C over that for A results in an annual saving of $1,225 worth of coal, or 18 per cent gross on the added investment. As in the conditions obtaining two years ago, the choice lies between A and B. In the latter estimate it will be noted that the price of coal has advanced 250 per cent, heating apparatus 100 per cent and the average advance in the windows 45½ per cent.

It is questionable whether much consideration should be given to the 1918 analysis from a permanent investment standpoint.

It is scarcely to be expected that the prices on which the 1915-16 estimate was based will ever exist again, but the relative values of the various factors may recur. Each particular case must be worked out individually in accordance with the local conditions and the question of investment decided largely by the owner, who must consider it in its relation to the earnings of his other investments. Among the other factors to be considered in choosing the type of window to be used, are the relative costs of upkeep, depreciation, effect on insurance rates, ease of operating the movable parts, the effect on the window structure of the changes in the weather and many other conditions.

The records kept during the tests on heat transmission showed that condensation appeared on the single-glazed sash when its temperature was low enough to cool the air confined within the test box below the dew point. This moisture was evident on the inside of the panes of glass. In the case of the double-glazed sash the reason for condensation or its absence, was not so apparent. Condensation appearing in the air space was always on the outside pane of glass, which, of course, was the cooler one. The wood sash showed no internal condensation; in the two-steel sash condensation was very marked and was evident in the hollow metal sash. Following no apparent law, the deposition of moisture in the metal sash occured on some lights and not on others. As this action was more marked on the solid steel sash, they were selected as the most suitable to use for investigating the cause and elimination of condensation.

The steel sash having a ¾-inch air space was chosen for the preliminary test. Later tests were made of the hollow metal and wooden sash to verify or disprove the conclusions of the first test. Holes were bored through several of the outer panes of wire glass, of which some had and some had not shown condensation. Smoke was then blown into the various air spaces through these holes and leaks to the outside or to adjacent air spaces carefully noted. Each light tested was found to leak considerably, some to adjacent air spaces, some to the front or back, and some showed combinations of these conditions. In some cases leaks occurred through the joints in the steel sash bars, as well as through the putty. It was observed that in lights where condensation was evident, the greatest leakage was into the test box and that in those lights where no condensation occurred, the greatest leakage was into the air outside the box. Other lights showed serious leaks to both sides and to adjacent air spaces and also showed condensation.

Acting on these observations, the entire sash was re-glazed and holes bored in seven outer panes and in five inner panes. Free communication was thus established to the external cold air or the warmer air inside the test box. Each pane of glass opposite those with holes was carefully bedded to confine and control the air leakage to the side having the hole. Smoke tests before and after each test showed that the desired object had been attained by this means. The remaining eight lights were made as airtight as possible on both sides by careful bedding and setting. The sash was then placed in position on the test box and the temperature of the box raised to about 70 degrees Fahr. above the surrounding room and records kept of the temperatures, relative humidity and condensation, the latter being allowed to accumulate for a period of at least

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eighteen hours. The relative humidity in the test box was maintained as near 40 per cent as possible. That of the outside air varied from 60 to 90 per cent, apparently having little effect upon the results except to hasten or retard the drying out process.

A careful examination of the sash showed uniformly the following results:

a Lights in which the air space opened to the outside or *cooler air only,* showed no condensation.

b Lights in which the air space opened to the *warm air* inside the box showed much condensation.

The sash was then reversed, with its outer side toward the interior of the test box, and after a test lasting three days a careful examination showed that the air spaces in which there had been condensation during the previous test were now uniformly dry, while abundant condensation appeared in those which showed none in the first test. It was also discovered that, by varying alternately the temperature in the test box, the processes of condensation or drying were accelerated. In each test, some of the lights which apparently had been puttied on *both sides* showed condensation, and some did not. The experiment on the reversed sash confirmed the conclusions *a* and *b*. A similar test was run on the hollow metal sash with the same results.

The explanation for these conclusions is simple. Changes in temperature on either side of the sash cause corresponding, though less marked, changes in the temperature of the air space. The pressure of the confined air, therefore, becomes greater or less than the atmospheric pressure and air is correspondingly either forced out or admitted through the drilled holes, and, if the temperature difference is alternately increased and decreased, a "breathing" action occurs in the air space. A similar action occurs through leaks in actual practice and is due to daily variations in temperature and the longer seasonal changes.

Air entering an opening of this kind *from the inside,* coming as it does from the warm interior of the test box or building, becomes chilled and its relative humidity correspondingly increased, condensation necessarily appearing if the cooling is carried on below the dew point. "Breathing," or a repetition of this process, necessarily results in a gradual accumulation of condensation.

Conversely, air entering an opening of this kind from the outside becomes heated, and its relative humidity correspondingly decreased, making impossible the precipitation of any moisture.

The double-glazed wood sash was tested in the same manner, eight lights being bored, but no trace of condensation in any of the air spaces could be found.

The conclusions arrived at by those who conducted these very interesting and instructive tests, are that these experiments indicate that condensation in the air space of double-glazed sash can be eliminated almost entirely by connecting the air space directly to the outside air, and at the same time effectively sealing it from the entrance of the warm air within the building. It is not claimed, however, that this method will absolutely prevent condensation at all times, for extreme climatical conditions might arise, such as continued warm, humid weather out of doors followed by a sudden or extreme drop in temperature, which might cool the confined air below its dew point. Condensation caused in this way, however, would be slight and temporary, and instead of accumulating, would eventually dry up with a further change of atmospheric conditions.

Whether or not, as a practical problem, double-glazed steel sash can be constructed with the inside panes sealed and an opening in the outside panes, is worthy of the careful consideration of steel sash manufacturers. In attempting such a design, it is suggested that the following points be considered:

a The opening should be *very small,* equivalent, say, to a ⅛-inch hole, designed merely for a communication, during temperature changes, between the internal air space and the outside air. A large opening would result in direct heat loss by convection from the air space.

b From the standpoint of the elimination of condensation, the location of the "breathing hole" was found to be immaterial, but a consideration of heat economy would indicate that the bottom of the light is preferable.

c The "breathing hole" should be protected from the weather and dirt.

d A high-grade elastic putty should be used. On account of wind pressure, difference of expansion between steel and glass (about 65 per cent), careless setting, etc., absolute sealing of the inner panes probably will not be accomplished. However, these tests show that a sufficient degree of tightness can be obtained, and that the larger part of the "breathing" will occur through the opening made for this purpose.

e Leaks between air spaces should be eliminated.

The results of these tests should not be construed as indicating that double-glazed wooden sash never show interior condensation, but merely that they are superior to steel and hollow metal sash in this respect in the stage of development of the latter types when these tests were made.

In an attempt made to make several of the lights airtight on each side, it was found that, on the ap-

plication of heat, leaks developed. This was due either to the different expansion co-efficients of the materials or to the fact that the pressure in the air space, increasing with the temperature, was sufficient to force a channel of escape or both. Indeed, if such an opening had not been forced, the plain, single-thick glass would be broken by the internal pressure thus developed. An increase in temperature of only 32 degrees Fahr. will create a pressure of one pound per square inch on the glass, or a total pressure of 200 pounds, which was found sufficient by actual experiment to break the single-thick pane. The reason why some of those lights which had been puttied tightly each side showed condensation and some did not is now apparent; that is, on heating up, leaks were developed either to one side or the other, condensation appearing or being absent according to the foregoing laws.

Economical Proportions of Concrete Slabs and Simple Concrete Beams

By ELLERY DAVIS, *Architect*

IT is obvious that for any simple concrete beam or slab, the ratio of cost of steel to cost of concrete being given, there is a fixed ratio of steel to concrete which will produce the greatest strength per unit of cost. It is also obvious that in order to secure true economy of design it is necessary to take into consideration not only the cost of the beam or slab in question, but also the cost of the supporting beams and columns as affected by the dead weight of the original beam or slab.

For convenience adopt the following notation, most of which is according to well-established precedent:

- c volume of concrete in supporting beams and columns required to carry dead weight of unit beam or slab.
- k ratio of depth of neutral axis to effective depth of beam or slab.
- K a numerical coefficient determining the strength of a concrete beam or slab, such that $M = Kbd^2$
- M moment of resistance of concrete beam or slab $= Kbd^2$
- d effective depth of beam or slab in inches.
- b breadth of beam or slab in inches.
- n ratio of moduli of elasticity of steel to concrete.
- p ratio of volume of steel to volume of concrete in beam or slab.
- Q cost ratio of equal volumes of steel and concrete, including as part of the concrete the cost of the supporting members; hence

$$Q = \frac{R}{Rs + c + 1}$$

- R cost ratio of equal volumes of steel and concrete.
- s volume of steel in supporting beams and columns required to carry dead weight of unit beam or slab.
- T total cost of a unit of concrete beam or slab, including cost of beams and columns supporting dead weight of beam or slab.
- $\propto$ a symbol meaning "is a constant multiple of." It may be shown that

$$\frac{M}{T} \quad \frac{(3k - k^2)\ (1 - k)}{2n\ (1-k)\ (Rs + c + 1) + Rk^2}$$

which will attain a maximum value when

$$\frac{R}{Rs + c + 1} = \frac{6 - 16k + 14k^2 - 4k^3}{3k^2 - k^4} n = Q$$

To determine the most economical percentage of steel for a given beam or slab it is necessary to first determine s, c and R, to compute Q from the formula $Q = R/(Rs + c + 1)$, and to take the corresponding values of k, p and K from the table.

To derive general formulas for s and c, it is convenient to adopt the following additional notation, all applying to the (concrete) supporting beams and columns:

- α a factor such that $M = 12\ w\ L/\alpha$
- b breadth of concrete beam or slab in inches.
- d' effective depth of supporting beam in inches.
- f_c working stress in concrete, pounds per sq. in.
- f_s working stress in steel, pounds per sq. in.
- H height of column from footing up, in feet.
- L length of beam in feet.
- m unit compressive stress on column.
- p' ratio of steel to concrete in column.
- v shearing stress of concrete in beam.
- w weight of concrete, pounds per cu. ft.
- x ratio of length of reinforcement to length of beam.

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It may be shown that

$$S = \frac{x\,w\,L^2}{12\,a f' d'} + \frac{p'\,w\,H}{144m}$$

and that

$$c = \frac{w\,L}{288v} + \frac{w\,H}{144m}$$

Assuming average values as follows:

$L = d'$ $f_s = 18{,}000$ lb. $w = 150$ lb. $m = 600$ lb.

$p' = .01$ $x = 1.14$ $a = 10$ $v = 120$ lb.

it may be shown that

$$s = .00008\,L + .0000174\,H$$

and

$$c = .0043\,L + .00174\,H$$

The accompanying table gives values of Q for various values of L and H based upon the above assumptions.

TABLE OF VALUES OF Q
RATIO OF COST OF STEEL TO COST OF CONCRETE (R)

L Feet	H Feet	30	40	50	60	70	80	90	100
10	10	27.5	36.4	45.1	53.6	62.1	70.3	78.5	86.4
	20	27.0	35.6	44.0	52.3	60.4	68.4	76.2	83.8
	30	26.4	34.8	43.1	51.0	58.8	66.6	74.1	81.5
	40	25.9	34.1	42.2	49.8	57.5	64.9	72.1	79.2
	50	25.4	33.4	41.2	48.8	56.1	63.3	70.3	77.1
15	10	26.7	35.2	43.5	51.5	59.4	67.1	74.7	81.9
	20	26.2	34.4	42.5	50.3	57.9	65.4	72.6	79.7
	30	25.6	33.7	41.6	49.2	56.6	63.8	70.7	77.6
	40	25.2	33.0	40.7	48.0	55.2	62.2	68.9	75.5
	50	24.7	32.4	39.8	47.0	53.9	60.7	67.4	73.5
20	10	26.0	34.1	41.9	49.6	57.0	64.3	71.3	78.1
	20	25.4	33.4	41.0	48.4	55.6	62.6	69.4	76.0
	30	25.0	32.7	40.2	47.4	54.4	61.2	67.7	74.1
	40	24.5	32.0	39.4	46.4	53.2	59.7	66.0	72.2
	50	24.2	31.4	38.6	45.4	52.0	58.4	64.5	70.4
25	10	24.8	32.4	39.8	47.0	54.0	60.6	67.1	73.3
	20	24.3	31.8	39.0	46.0	52.8	59.7	65.5	71.5
	30	23.9	31.2	38.3	45.0	51.6	57.8	63.9	69.8
	40	23.4	30.6	37.5	44.1	50.5	56.5	62.4	68.0
	50	23.0	30.0	36.8	43.2	49.4	55.3	61.1	66.5

$Q = R/(Rs + c + 1)$. $s = .00008L + .0000174H$. $c = .0043L + .00174H$.
These values of s and c are based on the following constants assumed as average for concrete supporting beams and columns:
$L = l'$ $f_s = 18{,}000$ lb. per sq. in. $w = 150$ lb. $m = 600$ lb. per sq. in.
$p' = .01$ $M = 12wL/10$. $x = 1.14$.

Conclusions: The formula defining the relations of Q and k is based upon the usual formula for the resisting moment of a concrete beam in which p exceeds the so-called "critical value," and the strength of the beam or slab is determined by the concrete; hence the necessity for limiting values in the table.

A similar formula may be derived based upon the smaller values of p and the strength of the steel as the determining factor. This does not give useful results, however, as the corresponding values of Q and R are all impossibly high.

In other words, it is never economical to use less than the "critical" percentage of steel; it is usually economical to use more, even at the prevailing high prices and consequent high values of Q and R. The most economical value of p decreases as R increases, and increases rapidly when the slab is carried on long beams and columns.

When the slab rests directly on a masonry wall, note that s and c vanish and $Q = R$.

The general formula for s and c given above are for concrete beams and columns. It is assumed that the supporting beams will be T-beams in which the strength is determined by the steel.

If the supporting beams and columns are of steel $c = o$ and s may be easily evaluated.

To illustrate the use of this data, assume a given concrete slab supported on concrete beams averaging 20 ft. span and on concrete columns 50 ft. high from footing to slab. Cost of reinforcing steel in place at $0.045 per pound, cost of concrete in place $0.30 per cubic foot, and all other conditions approximately as assumed in the text.

To determine the percentage of steel for maximum economy of design

$$R = \frac{\text{cost of steel per cu. ft.}}{\text{cost of concrete per cu. ft.}} = \frac{.045 \times 3.4 \times 144}{.30} = 73.4$$

From the table of values of Q we find that for beam and column lengths of 20 ft. and 50 ft. respectively, Q is 52.0 when $R = 70$ and 58.4 when $R = 80$. Interpolating between these values, we find that $Q = 52.2$.

CORRESPONDING VALUES OF Q, k, p AND K

Q	k	p	K_1	K_2
82.7	0.35	.00625	100.3	.....
75.3	0.36	.00675	103.0	.....
68.6	0.37	.00725	105.4	113 4
62.6	0.38	.00780	107.8	116 0
57.2	0.39	.00833	110.3	118 7
52.3	0.40	.00889	112.7	121.8
47.8	0.41	.00950	115.1	124.0
43.8	0.42	.01010	117.5	126.2
40.1	0.43	.01080	119.8	128.7
36.7	0.44	.01150	122.0	131.3
33.6	0.45	.01230	124.3	134.0

K_1 is based on $f_c = 650$ pounds per sq. in.
K_2 is based on $f_c = 700$ pounds per sq. in.
Limiting values of Q and corresponding values of k, p, and K are as follows:

f_s	Q	k	p	K_1
18000	82.7	0.35	.00625	100.3
16000	63.7	0.378	.00770	107.3
f_s	Q	k	p	K_2
18000	70.6	0.367	.00710	113.0
16000	54.8	0.395	.00860	120.0

When the value of Q exceeds the limiting value above given, use the limiting value instead of the actual value. This will insure that the safe working stress on the steel is not exceeded.

From the table of corresponding values of Q, k, p and K, we find that when $Q = 52.2$, $p = .0089$.

Therefore the greatest economy in design will be attained when the ratio of steel to concrete in the slab is .0089, for which the corresponding value of K is 112.7 if a maximum fiber stress of 650 lb. per

sq. in. is assumed for the concrete, and 121.8 if a maximum fiber stress of 700 lb. per sq. in. is assumed.

After determining K, the thickness of the slab may be readily determined from the formula

$$d = \sqrt{\frac{M}{Kb}}$$

In using the tables the following observations are of interest:

With very light loads the theoretical value of p will often give a slab too thin for practical purposes. In such cases, considerations of deflection and resistance to shock will determine the design.

When steel is very expensive and the supporting beams and columns very short, the values of Q are large and will exceed the "limiting values" given in the table. In other words, the theoretical value of p is so small that it is insufficient to develop the full working strength of the concrete. In such cases the "limiting values" of Q, p and K given in the table should be used.

A Proposed Needed Law

AN important bill now pending before the house committee on education about which little has been said is that introduced by Congressman Howard of Georgia to establish engineering experiment stations in the different states in connection with state supported universities or engineering schools for the promotion of engineering and industrial research.

It is provided that in order to aid in the promotion of engineering and industrial research and distribution among the people of the United States and to make available the natural resources of the United States, as a measure of industrial, military and naval preparedness, in times of peace and war, there would be established in each state under the direction and in connection with some state supported engineering school or university, a department of engineering to be known and designated as the engineering experiment station.

It would be the object and duty of this experiment station to conduct original researches, perform and verify experiments, and make tests and investigations in any and all branches of engineering, manufacturing and the industries, and to compile data relating to the engineering and industrial research for the promotion of the same in the interests of the people of the United States.

Bulletins giving the results of these researches and of progress made would be published at the stations established at least once every year and copies sent to persons, newspapers, libraries, interested in such industries.

For the purpose of paying the necessary expenses of conducting these researches, each state would receive $15,000 annually.

The state legislature of each state would be authorized to designate and appoint that state institution of its respective state which is best equipped and organized to conduct the work intended under this act. In any state where there is not more than one well organized and equipped state supported engineering school, the governor may designate and appoint that institution to perform the proposed research.

Congressman Sears of Florida is chairman of the committee which is soon to hold hearings on this bill and there is a strong possibility that a favorable report will be made and the bill passed.

Just at this time it is recognized that in the United States there is almost an unlimited source of raw products of different kinds needed in the war, but that for lack of proper investigation made heretofore to get these products out and place them in commercial condition, these resources have not been worked to their fullest extent. If the bill passes, government experts will immediately begin the task of ascertaining just what each state can best produce and thus our manifold productions may not only be much increased, but also conserved and put to the best practical uses.

The Value of Quarantine

AS we become more accustomed to the power of military authority, some of its advantages become apparent. While this authority cannot control some of the conditions outside the military reservations, it does have control over the actions of the soldiers, and in this way make it advisable for those outside of the reservation to comply with certain requests.

On May 23 Major General Scott, commanding at Camp Dix, notified the authorities of Wrightstown, N. J., that no officers or enlisted men would be permitted to enter that town until they have remedied certain conditions. Early in February the officials of Wrightstown were notified that unless they installed a sewer system with all its attendant sanitary appurtenances, soldiers would be barred from the town. This was a verbal order and no steps were taken to comply with it.

Naturally, the monetary loss of the patronage of many thousands of soldiers and visitors will affect the business interest of the town and it will un-

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doubtedly outweigh the cost of the improvements demanded.

The installation of a sewerage system gives employment to sewer diggers and plumbers, and with the house alterations that follow, to painters, plasterers, carpenters and other trades. The warehouses of manufacturers are full of unsold goods and all of the materials are available. If boards of health would exercise their police powers of condemnation or quarantine all of our antiquated and unsanitary towns would be overhauled to the benefit of everyone, including the property owners. These things may follow in the wake of military authority.

Special Advanced Courses in the Mechanics and Properties of Materials of Construction and in Materials Testing

THE 1918 Summer Session of the University of Illinois will offer special advanced courses planned especially for instructors in mechanics in trade schools and technical schools, for chemists who wish to fit themselves to take positions involving the physical testing of materials, and for men who wish to fit themselves for positions in commercial or government testing laboratories. Three special courses will be offered:

1. *Advanced Mechanics of Materials.*—Advanced problems in strength of materials. A knowledge of elementary mechanics of materials is a prerequisite for this course.

2. *The Properties of Engineering Materials.*—Lectures and assigned reading on the properties of iron, steel, other metals, wood, brick and concrete. A knowledge of elementary mechanics is a prerequisite for this course.

3. *Laboratory Work in Testing Materials.*—Study of testing machines and strain measuring apparatus; practise in standard methods of testing and tabulation of test results. A course in elementary mechanics of materials accompanied by work in the laboratory is a prerequisite for this course.

The extensive equipment of the Materials Testing Laboratory of the University of Illinois will be available for this work, which will be under the direct charge of Mr. H. F. Moore, Research Professor of Engineering Materials.

Further information concerning the courses and expenses may be obtained from The Director of the Summer Session, University of Illinois, Urbana, Illinois.

A Technical Governor

MANY civil engineers are now acting as city managers for the 100 cities now being operated under the commission form of government. The majority of these cities are located in the central and western states, where there is a refreshing freedom from servile adherence to precedent and entrenched political power, and it is that section which leads the way to better forms of government.

A notable example of the new order is the appointment of a civil engineer as governor of Alaska by President Wilson. Thomas Riggs, Jr., M. Am. Soc. C. E., Governor of Alaska, graduated 1893 from the School of Science of Princeton University. In 1911 he was appointed engineer of the Alaska Boundary Commission and for the past four years has been a member of the Alaskan Railroad Commission.

It is gratifying to know that the technical man is being recognized as a man eminently fit to occupy the so-called political positions. To be a city manager requires executive ability of a high order and coupled with it a technical knowledge of the material things that are employed in the construction and maintenance of public works.

There are, however, as many architects proportionately who are capable of serving the public in this work in which the engineer has proven to be so useful. Architects have the technical knowledge, judgment and experience gained through the conduct of large affairs, which is necessary for the successful conduct of such work.

These changes indicate the passing of the lawyer and the professional politician from these activities, and it is extremely gratifying to know that the offices of territorial governors are not to be entirely a refuge for "lame ducks." Technical men as city managers and territorial governors, why not as aldermen, legislators, congressmen and presidents?

Industrial Information

Soft Pine in the Modern Home

"The Home You Longed For" is the title of an attractive pamphlet recently issued by the Arkansas Soft Pine Bureau, Little Rock, Ark. This folder contains a series of plates giving exterior views, floor plans and descriptions of interesting Colonial houses, all modern in feeling yet marked by the simplicity and dignity characteristic of all good Colonial types. The costs of the component parts of the structures, together with total costs, are given in most cases.

At the end of this series are a number of photographs of graceful Colonial doorways, an interesting stair-hall, and finally a page of condensed information as to how to finish Arkansas soft pine. A list is given of the mills which produce Arkansas soft pine and which are members of the Arkansas Soft Pine Bureau.

This bulletin should be of interest to the architect, and might well find a place in his files, since the information is concise, accurate and most attractively assembled.

Industrial Housing

Illustration of recent housing projects form the basis of an interesting booklet published by the National Fire Proofing Company, Fulton Building, Pittsburgh, Pa. The attractive possibilities of hollow tile construction for these purposes are set forth in an unusually interesting way. Photographs are shown of a great many of the better industrial housing developments in this country in which fire-resisting construction of Natco hollow tile has been used. Full information regarding these houses is given in an accompanying statement.

This booklet is very interesting, showing as it does, in a general yet comprehensive way, the extent and scope of present-day housing activities. It is also interesting to note the possibilities, from the standpoint of design, of hollow tile construction for these purposes, as evidenced by this publication.

Hollow Tile for Industrial Housing

"Natco Homes for Workingmen" is a bulletin (No. 173) published by the National Fire Proofing Company, Fulton Building, Pittsburgh, Pa. Here may be found a number of suggestions with regard to low-cost housing, and valuable facts as well relative to the possibilities of hollow tile for these purposes. The following are presented by this company, as being the advantages accruing from the use of hollow tile for low-cost housing:

FIRST—Natco is made of hard burned clay—fireproof and everlasting.

SECOND—The units lay up rapidly in a wall, thus assuring a great saving in time and labor.

THIRD—Natco is cheaper than any other form of masonry construction.

FOURTH—While Natco costs a little more than frame construction, it proves the cheapest in the long run because of the saving in painting and repairs.

FIFTH—Laid up on end, it provides a bearing wall of maximum strength with a minimum of weight.

SIXTH—The enclosed air spaces in the hollow tile walls insure an insulation that is impervious to moisture and highly resistive to temperature changes.

SEVENTH—A Natco wall cannot be penetrated by rats or other vermin.

EIGHTH—With Natco homes you are assured a healthy lot of contented and efficient workmen.

NINTH—Natco is manufactured by the largest tile manufacturers in the world who, with nearly thirty years' experience, stand back of Natco's every claim.

TENTH—Twenty-three Natco factories assure a wide and economical distribution to the consumer.

LASTLY—Should you desire further assistance in solving your building or fire proofing problems, an efficient corps of skilled engineers is at your service.

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"Vanco Bronze" for Lighting Fixtures

The Mitchell Vance Company, Inc., 503-511 West Twenty-fourth Street, New York City, has issued two booklets showing the use of its new metal, "Vanco Bronze," in lighting fixtures. In an introduction reference is made to the careful study in design given the products of this company. Special emphasis, it is stated, has been placed on adaptations from period designs, made suitable for modern electrical usage. The suitability of "Vanco Bronze" for modern illuminating purposes is also shown in the booklets, which are fully illustrated. "Vanco Bronze" is a unique metal for lighting fixture purposes, in that it is cast rather than spun. This makes it most adaptable from the standpoint of design, and also makes possible attractive fixtures at a low cost. The special low-cost fixtures which this company has evolved for industrial housing purposes are evidence of the possibilities of the metal.

New Edition of Truscon Building Products Booklet

A useful and convenient publication, issued for architects and builders, is "Truscon Building Products," published by the Truscon Steel Company, Youngstown, Ohio. The book, which is convenient pocket size—3½ x 6 inches—contains a fund of useful tables and building information. It constitutes, in fact, a compact digest of the many catalogs published by this company, and its products are fully described therein.

Copies of this book may be obtained upon application to the manufacturers.

Pressed Galvanized Steel Windows

In Bulletin No. 202, the S. H. Pomeroy Company, 282-296 East 134th Street, New York City, describes its most recent development in fire retardant windows—a maximum lighting window in which the rolled steel members common to the usual window of this type are replaced by narrow members pressed to shape from heavy gauge, heavily galvanized sheet steel. This window—Pomeroy No. 14—is made in both counter-balanced and double-hung types, with any desired arrangement of muntin bars. Descriptive matter, specifications and detail drawings are presented in this bulletin, together with photographs of this window in different styles.

Waterproofing for Roofs

Liquid roofseal is a waterproofing compound manufactured by the Manhattan Paint Company, Cleveland, Ohio. This material, it is stated, is an asbestos roofing compound in liquid form, which gives wornout roofs a thick, elastic, waterproof coating that lasts for years. This substance is said to set quickly; will not run in hot weather; has a covering capacity of about 125 sq. ft. to the gallon on metal surfaces and about 75 sq. ft. on paper, felt, composition and shingles; its color is black, and it is simply and easily applied. This material is guaranteed for eight years.

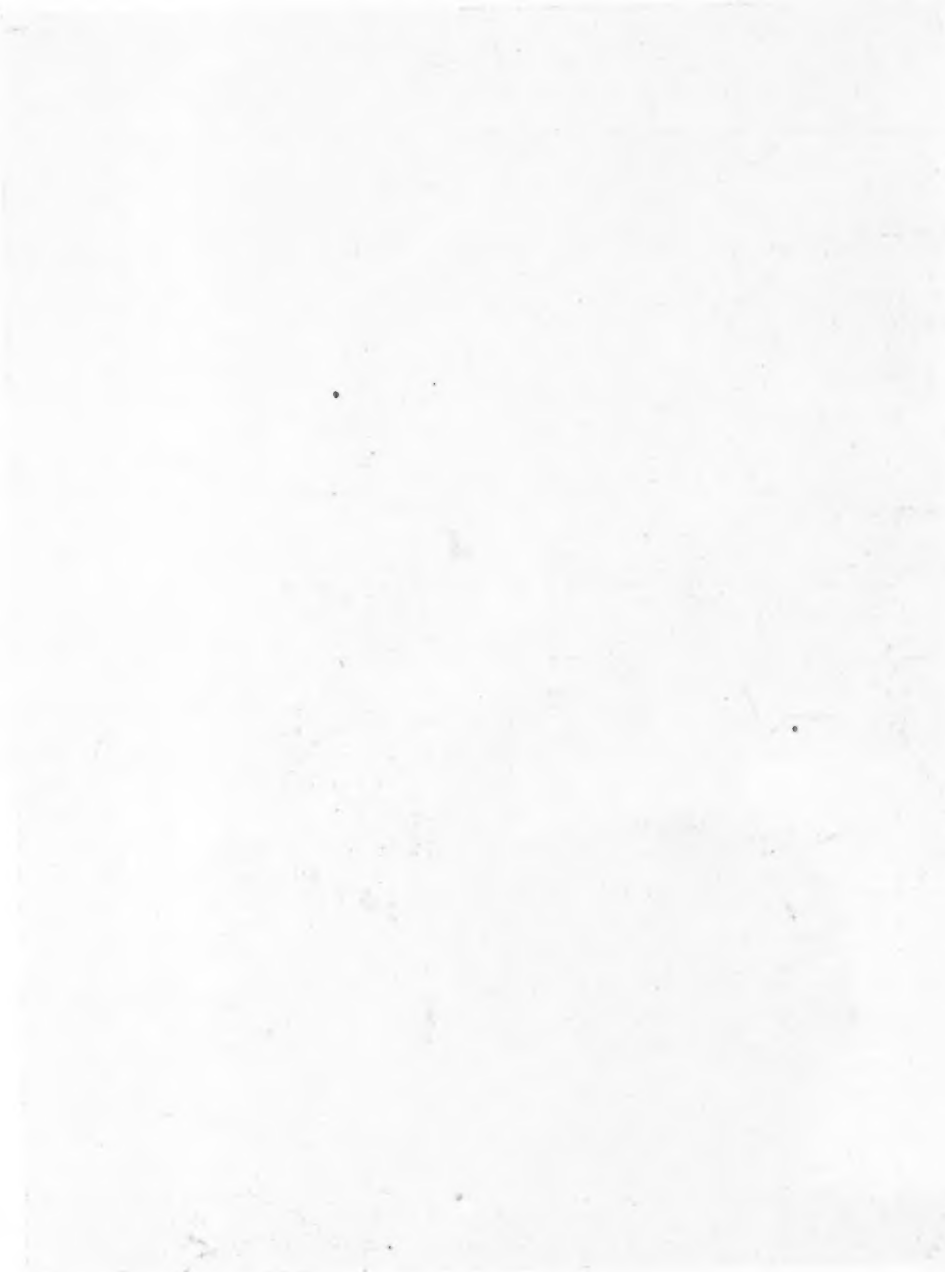
Natural Air Heating

In its catalog FB-52 the Sill Stove Works, Rochester, N. Y., describes its Sterling furnaces, heating supplies and accessories. Complete information, illustrations and testimonials are given in this catalog, not only with reference to the furnaces, but to the accessories as well. Dimensions, capacities and prices are also given.

Safeguarding the Home

The National Board of Fire Underwriters has prepared for the United States Bureau of Education a fire prevention manual for the school children of America. This manual, entitled "Safeguarding the Home Against Fire," contains much information as to danger from fires, valuable to the adult as well as to the child. The various careless ways in which fires are brought about are vividly portrayed, not only in the text, but in accompanying marginal sketches. Special chapters are devoted to each of the worst fire dangers—matches, stoves, kerosene, gasoline, and the like, with information as to their safe usage; how to put out fires caused by these agencies and other useful facts are also presented.

This is a book which should have widespread circulation. The information and the argument it contains should be in the minds of our entire population as a large factor in reducing the tremendous unnecessary waste which occurs from fires.



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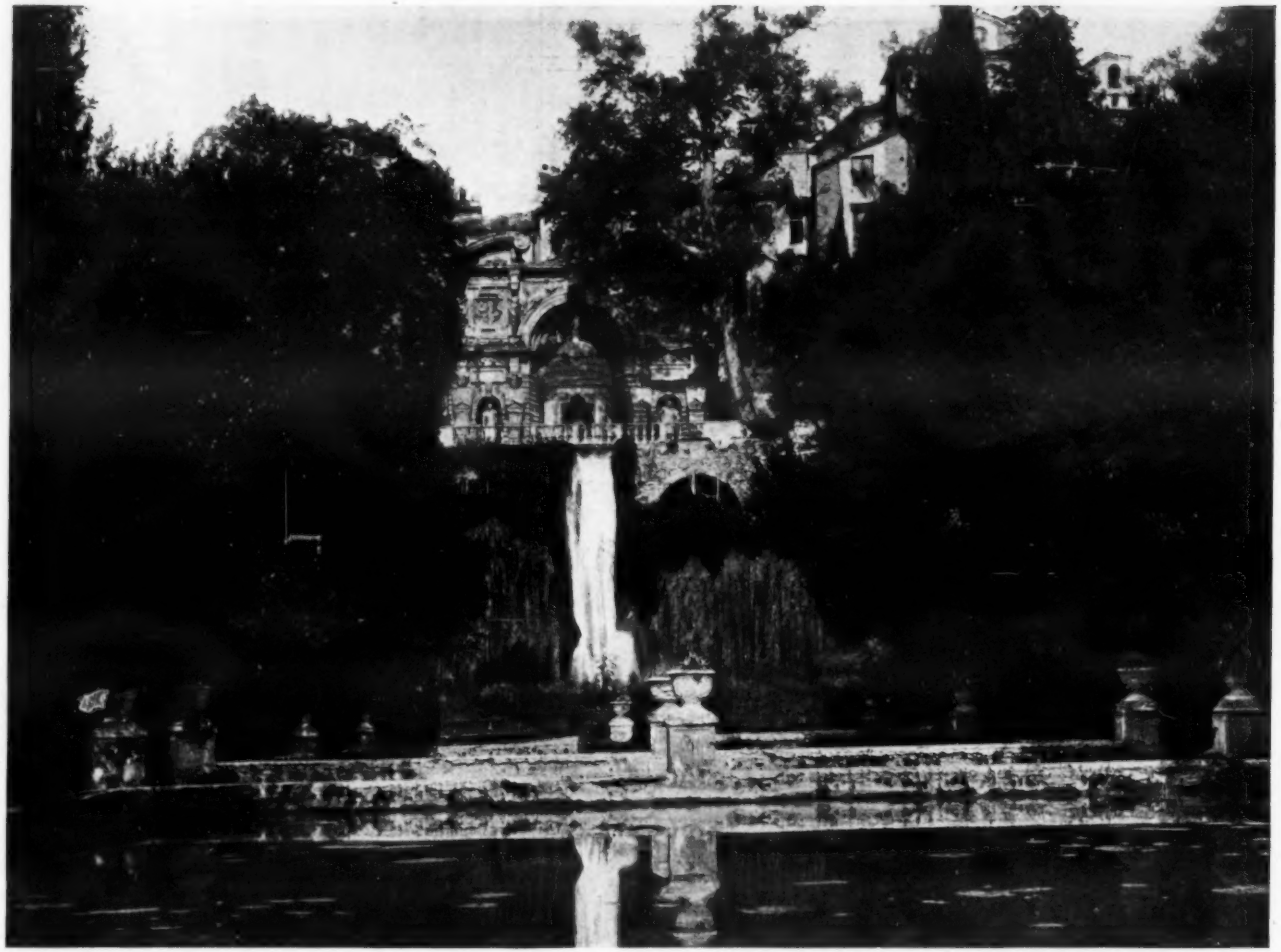

FOUNTAIN, VILLA D'ESTE, TIVOLI, ITALY